those books intended for circulation.

ARTICLE VI.—The Secretary shall have authority to loan to Members and to holders of second class stock, any work belonging to the SECOND CLASS, subject to the following regulations:

Section 1.—No individual shall be permitted to have more than *two books* out at one time, without a written permission, signed by at least two members of the Library Committe; nor shall a book be kept out more than TWO WEEKS; but if no one has applied for it, the former borrower may renew the loan. Should any person have applied for it, the latter shall have the preference.

Section 2.—A FINE OF TEN CENTS PER WEEK shall be exacted for the detention of a book beyond the limited time; and if a book be not returned within three months it shall be deemed lost, and the borrower shall, in addition to his fines, forfeit its value.

Section 3.—Should any book be returned injured, the borrower shall pay for the injury, or replace the book, as the Library Committee may direct; and if one or more books, belonging to a set or sets, be lost, the borrower shall replace them or make full restitution.

ARTICLE VII.—Any person removing from the Hall, without permission from the proper authorities, any book, newspaper or other property in charge of the Library Committee, shall be reported to the Committee, who may inflict any fine not exceeding twenty-five dollars.

ARTICLE VIII.—No member or holder of second-class stock, whose annual contribution for the current year shall be unpaid or who is in arrears for fines, shall be entitled to the privileges of the Library or Reading Room.

ARTICLE IX.—If any member or holder of second class stock, shall refuse or neglect to comply with the foregoing rules, it shall be the duty of the Secretary to report him to the Committee on the Library.

ARTICLE X.—Any Member or holder of second class stock, detected in mutilating the newspapers, pamphlets or books belonging to the Institute shall be deprived of his right of membership, and the name of the offender shall be made public.

Vol. XV. No. 89. 12th January, 1889. Monthly, Price 10d.

EACH • NUMBER • CONTAINS • VARIOUS

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

ORIGINAL DESIGNS

FOR SPINNERS, MANUFACTURERS, BLEACHERS, DYERS, PRINTERS AND FINISHERS,

EDITED BY
H. & R. T. LORD,
10, ANN PLACE,
LITTLE HORTON LANE,
BRADFORD,
YORKSHIRE.

OF COTTON, SILK, WORSTED, WOOLLEN, JUTE, AND ALL CLASSES OF TEXTILE FIBRES.

The Journal of Fabrics AND Textile Industries.

Vol. 13. No. 89. JANUARY 12th, 1889. Price 10d.

Contents.

Notices.

The Yearly Subscription—payable in advance—including home postage, is 10s. Cheques and Post Office-Orders to be made payable to H. & R. T. LORD, 10, Ann Place, Little Horton Lane, Bradford, Yorkshire.

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Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.

Cotton Fibre, Card Clothing, and Carding Engines.

Mr. John Butterworth of Shaw, recently delivered a lecture in Oldham, under the auspices of the Mutual Cotton Class. The subject was "On the effect that the parallelism of the fibre of which a yarn is composed has upon its strength and lustre, with its bearing on the recent improvements in card clothing and carding engines, illustrated by drawings and samples." Mr. Butterworth said:—To those who are unacquainted with the behaviour of animal and vegetable fibres in the process of converting them into a thread, the title of the subject I have chosen may be both new and unintelligible; in fact, I have serious doubts if the subject is at all understood by the great bulk of workers in fibrous materials. I am aware that the manner in which a fibre lies in forming a thread, whether it be lengthwise or crosswise of the thread, is of little importance in the construction of certain yarns, while it is of the utmost importance in others. Still, I consider the subject is of such moment that it ought to be well understood, at least, by those who may have to take charge of our mills, and it ought also to enter more into the programme of technical training. How few, for example, know that, in a yarn, which is composed of long and short fibres, the longest fibres during the drawing process naturally work their way to the centre of the thread and form the core, while the short fibres, on which the rollers have had no power to seize and straighten, lie coiled round the outside of the thread, hence, such yarns look more or less woolly, and, if they are unaware of this, they will not be conscious of the fact that the strength of such yarn is only equal to the number of fibres that form its core or centre part. I want to impress this on your minds, because it forms one of the strong points in the subject of this paper, and I wish to say here that what has induced me to draw your attention to the subject in this form is the feeling that while we, as a nation, have, for a long time, enjoyed the prestige as textile manufacturers and makers of the best textile machinery, there is danger, in the keen competition that has sprung up, that we may forget, or overlook, some of the vital principles of the several parts of our trade, and I feel bold enough to assert that some of the recent changes, or improvements, if you will have it so, in the carding department of the cotton trade, are likely to produce an effect in the yarn spun from them that has not been looked forward to by many. I hardly need tell you that the tendency in every process of preparing and spinning, including the carding, is to lay the fibre composing the yarn in as straight and as parallel a position as possible, and, according to the effective manner in which this is done, the yarn possesses more or less lustre and strength, according to the nature of the cotton used. The lustre of yarns depends on getting and keeping the fibres as parallel as possible in forming the thread; there is such an extensive surface of every individual fibre exposed to the light that, combined, they give off an iridescence, or lustre, that could not be produced when many of the fibres cross or twine round the thread; hence, the fact is not surprising that the more twist you put in yarn the more dull it looks. The lesson I wish to convey is this—that, whatever tends to place the fibres across the thread, instead of laying them the length of it, tends to weaken the yarn as well as to reduce its lustre. This is clear enough when you come to consider the extent of surface that is exposed to the reflection of the light from fibres that lie longitudinally in the thread, and compare it with the small amount of light that can be got from fibres that cross the thread transversely. This fact is demonstrated by samples of yarn which I have that show a great contrast, yet they only differ in the amount of twist that each contains. They are made by the same draft, and out of the same cotton, and, if further proof is wanted, I have a hank of yarn, part of which happens to have been spun from a very thick roving, probably a double one. This hank has been bleached, yet bleaching has not had the power to give a uniform lustre to the yarn, and the thicker portion, having more twist, seems to be yellower than the rest. I have often seen this feature in yarn before, and my first experience of it rather puzzled me. Having now shown you the effect that extra twist has on the lustre of yarn, giving it a dull yellow appearance, although it may be made from the same cotton, if we can show you samples of yarn made from the same cotton, the same counts, with equal twist, yet one is a more oozey thread than the other, while one is from one to two shades duller and yellower than the other, this difference must arise from some other cause than that of extra twist, to which I have referred. And when I tell you that the brighter and clearer sample is a combed yarn, while the other, which is dull and oozey, is only a carded yarn, yet both are made from the same Egyptian cotton, you must naturally conclude that the duller and more oozey yarn is so from the fact that more short fibre is left in it by being only carded than is left in the other which has been both carded and combed. But I have to call your attention to two samples of drawing, both from the third or last head of the drawing frame. Both samples are from the same mixing, and both have been carded on single revolving flat cards, with needle pointed wire. There is just as great a difference between these two samples of drawing as is seen in the samples of combed and carded yarn, and I have now to tell you that the only difference in the treatment of these two samples of drawing was in the amount of stripping and grinding. In the duller sample, the card had been neither stripped nor ground for one whole week, whilst the other had been stripped its usual number of three times a day, brushed out, and slightly ground, twice during the week. If I have proved (and I contend I have), by samples of combed and carded yarn, that cards do not take out all short fibre, how much more are they likely to let it go forward if they are not cleaned out at intervals? And if results like the above are shown with a production of 600 lbs. to 700 lbs. per week, what may we expect from the daily increasing productions that are reported from makers of single revolving flat cards even up to 1,200 lbs. per week? And we are told that we can have this great production with no more, or even a less, percentage of waste than has been formerly made with a production of not more than half this weight per week. If twice the amount is put through the card, and only the same amount of waste is taken out, where has the rest gone to? Can you say there was no waste in half the production of the card? My contention is this:—The card is loaded to its full capacity for the speed it runs, the wire is charged to its full extent, the doffer is enlarged and speeded, together with the flats, to relieve the cylinder of its load, but no additional stripping is recommended; the flats carry no more strip than they did, from the fact that they are driven faster, hence a large amount of short must pass on that ought to be taken out. I can give you more than one or two instances of loss of strength in these heavy productions, and, in one instance, the comparison was made between single revolving flat cards and double roller and clearer cards. I mention this because it was a mere chance test. The flat card was proved to be down in strength to the extent of 5 to 6 per cent. I know I shall be told that the revolving flat card, as now made, will card 1,200 lbs. per week as free from neps as it formerly used to card 600 lbs. The truth and accuracy of fit of its different parts is such that we can now set the wire to the $\frac{3}{1000}$th of an inch. All this I know, and am prepared to admit that, for mechanical accuracy, the revolving flat card has not its equal in any machine used in the spinning trade. But I cannot persuade myself that we are producing as sound and as clear a yarn by such close contact of the wire and such heavy productions. I shall, no doubt, be told that I need have no fear of the close running of carding surfaces, that the angle given to the card tooth, as at present made, removes the danger of their coming into actual contact, whatever strain the teeth may suffer from the weight of cotton passing over them. I mention this matter because I question if there are many who ever consider the influence this angle of the wire has upon carding. But, to cut the matter short, there is no doubt that the angle referred to

prevents the card surfaces coming into contact, and it is the mainspring in the low percentage of waste made for the heavy weight carded; but I contend that this saving of waste is at the expense of the strength and lustre of the yarn produced, when compared with lighter carding. I trust you see clearly that the point at issue in this lecture is this:—Whether we can persistently increase the production of a carding engine, by the means now known to be in operation, without endangering the strength and appearance of the yarn? There are several influences in operation to gain a heavy production that I feel jealous of, and my last lecture at Shaw, on "Card Clothing and Carding Engines," together with the present one, will, I hope, arouse thought on the subject. I cannot deny that I have felt a little flattered since I gave the last lecture by receiving several acknowledgments of the good service which that lecture has done, particularly in regard to the finish of card wire. I was told, about two months ago, by a person who is always well informed on this subject, that most card makers are now turning out a smoother card in steel than they had ever done since they began to make them, and he said he considered it due to my lecture, without wishing to flatter me. This may be blowing my own trumpet, but if you had given the attention to the subject that I have done, and had some of the experiences I have had in it, you could not help feeling glad, as I do, to hear of any improvement. I am only sorry to say that I have reason to know that what improvements have been made, have been made use of to make it appear to persons ignorant of the character of steel wire and steel cards that my former conclusions were groundless. I have more evidence, however, in proof of my former statements. For instance, regarding the scale on heat-hardened steel wire, I have proof that card makers were under the necessity of stopping the machines at intervals to clean the scale away. Since the above lecture, I have had samples sent me from at least three wire drawers, with a view to my examining them for scale, and I have to acknowledge that each sample was nearly free, but not one was entirely so. They are, however, a great improvement on the bulk of hardened and tempered steel wire made before that lecture. I wish I could say as much for any improvement in regularity of steel wire. Every card maker and every wire drawer that I have talked to, or corresponded with, all admit the irregularity of steel wire, but the evidence of this irregularity does not end here. A short time ago, I paid a visit to a friend of mine, who is a tool maker in Manchester, and I found him engaged on a machine for making steel wire mattresses, and he told me he had never in all his life had a more bothering job, and the whole difficulty lay in the irregular character of the wire. Some parts of the wire bent with the utmost ease, while others resisted the full power of his machine, and he was compelled to construct a machine that would accommodate itself to the irregularity of the wire. If it was necessary, I could give you more instances to show that we are not one whit nearer getting a homogeneous brand of steel for wire. At the last meeting of the British Association, the President, I believe, of the mechanical section, stated that the problem of the homogeneous character of steel was yet unsolved. If so, need we wonder that steel cards show an irregularity in the setting, or need we be surprised to find the teeth of cards nearly cut off at the bend when needle pointing is attempted by side grinding? And I may just say in passing that I have seen no reason yet to alter my views on side grinding. I would sooner take a wire with a configuration given to it by rolling—that would give it a continuous point of its own, however much the card is ground—than I would adopt what we have as yet had as an apology for a needle point. If my remarks, on the present occasion, have been sufficiently clear to you, you must perceive that I am not condemning the real improvements that have been made in the revolving flat card, but I do condemn the tests it is put to, and also put before the public as regards the amount of production. I can see that the spinning trade has gone into a rage after extra production, without pausing to reason out the wisdom of it. I admit that the changes in this card are, for the most part, legitimate ones for increasing production, but I am afraid that both machine makers and card makers are goaded by comparisons into using questionable means of increasing production. The private opinions of more than one maker are against these heavy weights, and I could mention one maker who has raised his voice publicly against it.

New Patented Fabrics.

PLUSH OR CUT PILE FABRICS.

An invention has been patented relating to a process for making plush, or cut pile fabrics, which differs essentially from the mode of manufacture previously employed, inasmuch as the nap or pile is produced without being woven into a back or supporting fabric, the fibres of the said pile being connected together by means of a layer or film of adhesive material which may itself form the back or ground or the medium of connecting the pile to a backing of ordinary woven fabric. The material from which the pile of the plush is to be made, whether in the form of threads, fibres, or ribbons, is wound on cores in the form of flat plates or strips of uniform width, corresponding to the intended length of the pile; these are placed with their broad faces in juxtaposition, and are clamped firmly together in a suitable press in which they stand up edgewise, their upper edges, over which the material to form the pile is wound, together forming an approximately level surface. Upon this surface, a layer or film of adhesive material, such as caoutchouc, is spread, to which a thin fabric may be caused to adhere, in order to strengthen it and form a backing. The material to form the pile is then cut along the opposite edges of the cores, which then fall out, and the plush is finished. The plush material may either be wound on pairs of plates or on laths of any suitable substance, for instance, of cardboard, wood, iron ribbon, bands, or sheets, &c., either by hand or by a reeling machine, suitably adapted for the purpose. A number of pairs of plates are wound as above stated, squeezed or pressed together on a bed or table between pressing cheeks, by means of screws or other means. To prevent those near the middle from rising with the pressure, they are held down by clamps applied over their ends, the clamps engaging under the bed or table, and being drawn down by screws. The upper side of the series of plates thus wound and pressed together is, as above mentioned, coated or covered with an adhesive substance (caoutchouc) whereby the threads, fibres, bands, &c., to form the pile, are united together. The operation of cutting the material to form the pile is effected by passing a knife along, and between, the lower or opposite edges of each pair of plates. When the adhesive substance is dry, a thin fabric may be caused to adhere upon it, the root ends of the pile being thereby more securely fastened. When the pairs of plates are made of iron bands or strips, each pair of strips is soldered together along one longitudinal edge, the knife for cutting the pile being passed between them at the opposite edge. Instead of pairs of plates as above described, single plates may be employed, provided throughout their length with a groove along one edge, through which the knife for cutting the pile is guided. Further, the plates may each be provided at their ends with upwardly directed knives which cut through the threads of the pile when the plates are being drawn out Instead of winding the plush material upon the plates, it may be brought upon a warp beam and conducted to the above-mentioned pressing table, where the warp threads are led in a zig-zag direction, alternately over, and under, and between, plates, or pairs of plates, the plates being placed in succession on the table, and alternately under and over the pile threads, &c., as they come from the beam, so as to cause them to assume the desired zig-zag direction. When thus arranged and clamped as before described, the upper side of the whole series is coated with an adhesive substance, to which a fabric is caused to adhere, whereby the bends of the threads which are uppermost in the press are united to the fabric. Or the fabric may be dispensed with, if a suitable adhesive substance be used, as before mentioned. The lower bends of the threads are then cut through in the manner above described, and the plush is finished.

PRODUCING PERMANENT COLOURED LINES ON WATERPROOF CLOTHS.

To produce coloured lines upon waterproof cloth is the object of a recent invention, and to carry this out, there is mixed with a rubber solution, such as is employed in waterproofing cloth, a suitable pigment of any desired colour, and this coloured solution is used in the manner in which an ordinary solution (whether coloured or not) is employed in waterproofing, but, for the purpose of marking on the lines, or bands, a knife is employed, constructed along its lower or bearing edge as a graining comb, that is with notches in such edge corresponding in width and position to the lines or bands which it is desired to form on the surface of the cloth or rubber, and of only such depth as will allow the proper amount of coloured solution to pass through as the cloth or sheet is drawn under the comb. The comb may be conveniently formed of a piece of zinc or other sheet metal, or of any suitable material, fixed by screws passing sideways through it, and screwed into a spreading knife of the ordinary description, or into a bar employed in lieu thereof, as will be readily understood, or may be otherwise fixed to such knife or bar. The solution employed is, of course, of a sufficiently liquid character for the purpose, and it is laid upon a surface of unvulcanized rubber previously laid upon the cloth in the usual manner, or forming the substance of the sheet. After the coloured solution has been laid on in lines or bands, the cloth or sheet is vulcanized or treated in an analogous manner to make it fit for use. In carrying out this invention, there is frequently a tendency, in making the lines or bands direct upon the surface to be ornamented, for the coloured solution to spread somewhat, and prevent the clearness of outline which is desirable. In this case, it is better to mark the lines in the manner above described upon a "taping" cloth, and after they have set to a slight extent, to transfer them to the surface to be ornamented, or lined, by rolling the taping cloth in contact with such surface between "doubling" rolls. Very clear lines may thus be produced with certainty upon the surface to be ornamented. It is impossible to describe in words the exact consistency which is best for the coloured solution in laying on the lines or bands, or the degree to which it should set upon the taping cloth before being transferred in the manner described, but these matters will be readily understood by persons skilled in the art to which the invention relates, and a very little experience will enable a workman to carry out the invention with the best results. The lines or bands may be formed wavy, zig-zag, curved, or slanting, if desired, by reciprocating the comb endways by means of a cam or crank action, or by the operation of inclined bearing surfaces, as the cloth or sheet is drawn thereunder, as will be readily understood by mechanics: a check pattern may be formed by first laying on the lines in one direction on the cloth and afterwards in the other direction, in which case, if the taping cloth is

employed, as is preferred, the lines are first laid on in one direction and transferred, and afterwards laid on in the other direction and transferred. In some cases, such as when a small surface only is required to be marked with lines or bands (as, for instance, for sheet rubber intended to be made into tobacco pouches or the like, or formed into rings such as are used with umbrellas), the comb may be drawn across the surface by hand, the coloured solution for producing the lines or bands being, in such case, drawn forward by the comb, except for that portion thereof which escapes through the notches as the lines or bands are being formed.

FELT STAIR CARPETS AND SQUARES, AND BORDERS FOR SQUARES.

This invention relates to the manufacture of bordered stair carpets and squares of felt, and borders for squares, the object of the invention being to produce upon the material a border having a more artistic and ornamental effect than hitherto obtained. In the manufacture of such bordered stair carpets and squares, and borders for squares, it has always been usual to produce the border by printing only, and, if it was desired to obtain an artistic effect, this could only be done on plain dyed wool felts by printing, which does not give so clear and distinct a design as is obtained by this invention, according to which the whole width of the carpet can be made of white, grey, or dyed wool, as preferred, and a border of the most artistic effect that can be desired can be worked thereon by taking a piece of felt, either dyed and printed or plain dyed or printed, on the white or grey, and cutting it up into strips of the required width for stair carpeting, or borders for squares, or into squares of the required size, and embroidering an ornamental border thereon by means of a chain stitch, or other embroidery, machine, in woollen thread, or other suitable material, and, by these means, the most brilliant ornamental borders in bright or sombre colours on different coloured grounds can be produced, much superior to, and more artistic in appearance, than any borders that have hitherto been produced upon felt carpeting by printing or other ordinary means.

Automatic Sprinklers or Fire Extinguishers.

THE "NEPTUNE."

"How to reduce the fire waste of this country," says the *Fireman's Herald*, "is a subject which agitates the minds of many people." The heads of various departments of different industries ask for more and improved facilities, the various associations of firemen have wandered around the outskirts of legislative intervention, the insured have frequently been threatened with an increase of rates unless their individual influence were thrown into the scale, and yet the fire waste continues, and, in fact, increases from year to year, with startling assurance to the observer of the statistics. No wonder then, as we have said, that the public should view with increasing interest anything which tends to the diminishing of this fearful waste. All experience of fires teaches one lesson, and so teaches it that the most ignorant quickly learn it—that is the need of prompt action the instant a fire breaks out, and there is certainly nothing but a self-acting, or automatic system, which will operate at the right moment and at the very spot, without needing the intervention of any human agency, will meet the case. The accidental overturning of a lamp—the flapping of a screen or curtain against a light—a little extra friction—a bit of greasy waste—a match—or an over-heated flue—nay, even a single spark, and the mansion, with its costly furniture, its rare pictures, its gems of art—the work of centuries of collecting; the theatre with its living mass of pleasure seekers; the mill or factory thronged with its busy workers, and its elaborate and valuable machinery; or the hotel with its scores or hundreds of sleeping visitors; or the temple with its devout worshippers, are suddenly changed from the the scenes of comfort, pleasure, industry, repose and devotion, to scenes of the direst calamity and destruction, and, where only a few moments before all seemed so secure, peaceful, and continuous, nothing is left but the sad scene of destruction accomplished by this most useful of servants, yet dreaded of masters. Even in this nineteenth century, with its immense array of patented and unpatented fire destroying apparatus, its mighty steam pumps, and well organized fire brigades of brave, well trained men, and experienced captains, equipped with all their modern appliances—numbers of lives and millions of pounds worth of property and goods are destroyed annually—things of the rarest worth, things that not all the wealth and power of the nations can ever replace, are often lost to us for ever as the result of one or other of these annihilating conflagrations. In our last issue, we commented on an automatic extinguisher which we believe will tend to popularise this system of fire extinction more than any other sprinkler has hitherto done, viz.:—The "Neptune" safe automatic fire extinguisher, now being made by Messrs. E. Walker and Co., of Heckmondwike, Yorkshire, and we propose to give a detailed description of its parts, which vary in some respects from any other sprinkler now before the public. Fig. 1 is a section of the sprinkler sealed and closed A represents a ferule or short tube attached to the water supply pipe. On the bottom or outlet end of the tube A, a rim (D) is attached, composed of ebonite or other material, which is a non-conductor of heat, and to the ebonite a metallic ring (C) is placed, which ring is fastened by solder (M), or other fusible material, to the deflector plate or disc E. The ebonite part (D) is made taper or conical, and fits into a corresponding recess formed in the deflector or disc E so that, when the parts are soldered together, they cannot be displaced by the pressure of water above, as is sometimes the case with those at present in use, and, in order to keep the water separate from the fusible solder and deflector plate, in the orifice of the tube A, a hollow cone-shaped piece of caoutchouc (F) or other like non-greasy material is inserted, so that, when the solder which is holding the deflector in position becomes melted by increased temperature, allowing such deflector to fall away from the orifice of the tube A, as shewn in Fig. 2, then the pressure of water will force the hollow cone-shaped capsule F from the orifice of the pipe, so as to allow the water issuing therefrom to impinge against the deflector, and to be diffused laterally in the form of spray, distributing such water over a considerable arrear, by which means, any fire taking place in a room would be extinguished without other aid or assistance. To allow the capsule F to be freely forced from the orifice of the pipe A, the capsule is covered with tinfoil or other thin non-adhesive substance, whereby the capsule is forced from its position by a very small pressure from behind. In order to catch and support the deflector after it falls away from the orifice of the tube A, three or other number of upright hooks (G) are fixed to the deflector, which catch on the edge

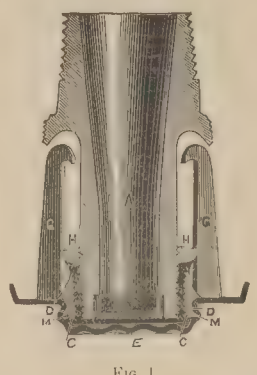


Fig. 1.

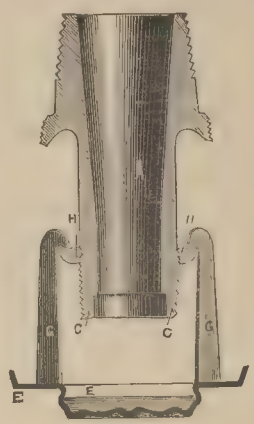


Fig. 2.

of the rim H, made secure on the outside of the tube A, and for the purpose of covering the several parts comprising the sprinkler, on to the nut of the tube a vulcanite shield or cover is screwed, which, although forming no essential part of the sprinkler, gives to it a neat and finished appearance. By constructing sprinklers in the above manner, a strong, sensitive, reliable, and automatic, device is produced and, in consequence of placing ebonite or other non-conductor of heat between the sensitive soldered parts and the water holding parts, the metallic connection is broken, consequently, there is no waste of heat by continuous metallic conduction or radiation from the metal to the water, as is the case in those sprinklers where the metallic connections between the deflector and the water are not broken. By this means, the heat received from the deflector is maintained, and not lost by being absorbed by the water, thereby rendering the sprinkler very sensitive and quick in its action. This sprinkler has been, for some time, in the hands of one of our most noted and accurate of scientists—Professor Archibald Barr, B.Sc., M I M E., Professor of Civil and Mechanical Engineering, who has been conducting a series of very careful experiments with this sprinkler, at the Yorkshire College, Leeds, and his report, just to hand, fully confirms all we said in our last issue concerning the same. The Professor gives a series of carefully tabulated tests, all of which prove the superior sensitiveness, strength, and spreading power of this sprinkler, which stood a test of 1,500 lbs. per square inch, without the slightest leakage, and with less than 20 lbs. water pressure, covering an area of 900 square feet. Professor Barr says:—"I have carefully examined the design and workmanship of your sprinklers, and I am of opinion that both are very good. I consider it to be a very important feature of your sprinklers that you have no brass surfaces in close contact with the part which has to give way. The absence also of any projecting parts which could be liable to accidental injury, and so cause the sprinklers to come into action when not wanted, is a very great advantage. I consider them amply sensitive for all purposes. All the sprinklers which I tested operated most satisfactorily, none failing to act. I believe the "Neptune" Sprinkler to be superior to any others, with which I am acquainted, in simplicity and strength of construction, and non-liability to injury or deterioration."

Classification of Articles in Customs Tariff.

ITALY.—The following decisions affecting the classification of articles in the Italian Customs Tariff have recently been given by the Italian Customs authorities:—Threads of bleached sewing cotton, not more than 10,000 metres per each half kilogramme, are classified as cotton thread for sewing, rolled on reels or spools, prepared for retail sale, and subjected to a duty of 110 lire per quintal, according to Category 99 Powdered wool (for tinting) is classified as "colouring matter of all kinds," and subjected to a duty of 12·50 lire per quintal, according to Category 72. Stockings of cotton net are classified as "network of cotton, in articles otherwise sewn," and subjected to a duty of 225 lire per quintal, with addition of 40 per cent. for the sewing, according to Categories 114*b* and 120*c*. Osier baskets with cotton ribbons are classified as "articles of basket-work and matting, fine," and subjected to a duty of 80 lire per quintal, according to Category 177*b*. Nets of linen thread, made of threads measuring more than 15,000 metres per kilogramme, are subjected to a duty of 49·50 lire per quintal, according to categories 79, 83*a*, and 80*c*. Small shawls of black wool, not embroidered, with a silk fringe, are classified as "trimmings of black silk, sewn," and subjected to a duty of 10 lire per kilogramme, with an addition of 50 per cent. for the sewing, by Category 160. Silk, thrown, double, raw, wound on reels, used, is classified as "silk, thrown, double, raw," and subjected to a duty of 38·50 lire per quintal, according to Category 145*a* of the tariff. Textures of jute, coloured, damascened, are classified as "jute textures, coloured, worked, having more than 40 threads between warp and woof in a square of 5 millimetres wide," and are subjected to a tax of 177 lire per quintal, according to Category 86*f* (4). Mr. Zossenheim, who has been to Rome to make representations to the Italian Government against the proposed raising of the tariff on Leeds mixed cloths, reports that his efforts have been successful, and that the goods will in future be admitted at the minimum rate.

SWITZERLAND.—Bobbinet tissues of cotton (lace tissues).—Category 287. Duty, 50 francs per quintal. Gloves of wool, knitted or made of net.—Category 359. Duty, 40 francs per quintal. Linen handkerchiefs and other articles, which are hemstitched or fringed and ornamented with revering, which consists of drawing certain of the warp or weft threads and tying or sewing the remaining threads, so that the interstices are diamond-shaped, so as to somewhat resemble lace inserting, are held to be not embroidered articles within the meaning of that term as used in Schedule J.

NEW ZEALAND.—The following statement shows the rates of Customs Duties now levied on imports into New Zealand, in accordance with the new Customs Act of the House of Representatives of New Zealand, passed on the 20th July last:—Silks, satins; velvets, plushes, not otherwise enumerated, composed of silk mixed with any other material, in the piece, 25 per cent. *ad valorem*. Cotton counterpanes, textile piece goods other than cotton or silk, shawls, yarns not otherwise enumerated, blankets, hosiery not otherwise enumerated, machinery not otherwise enumerated, 20 per cent. *ad valorem*. Carpets, floor cloths, and druggets, 15 per cent. *ad valorem*. The following articles enter New Zealand free of duty:—Bunting, only suitable for ships' flags; white and grey calico in the piece, cotton corduroy in the piece, cotton waste, duck in the piece: felt sheathing; Forfar, dowlais and flax sheeting in the piece, the fair market value of which does not exceed 7d. per yard; cotton moleskin in the piece, coloured shirtings in the piece, and union shirtings in the piece, the fair market value of which does not exceed 7d. per yard; sewing cottons, silks and threads; tailors' trimmings, Verona and Italian cloth; black and brown canvas; buckram, padding, silk, worsted, and cotton bindings and braids; Hessians; brown linen, silesias, union body linings, jeans, striped and checked drills; ticks, lasting, sateen, cotell and tapes; umbrella-makers' material, namely, reversible and Levantine silk mixtures, of not less than 44 ins. in width; alpaca cloth, with border; Zanella cloth, with border; dyestuffs and dyeing materials; engineers' machine tools, electric machinery and appliances; sewing, knitting and kilting machines; steam-engines, non-condensing, the area of whose cylinder or cylinders exceeds 1,000 circular inches; and condensing engines, the area of whose cylinders exceeds 2,500 circular inches; steam boiler tubes and Bowling's expansion rings.

The Development of Cape Trade.

The *Natal Mercury* (weekly edition) for the 10th October last, commenting upon the great strides made in the commercial development of Cape Colony during the last eight years says:—"A return which appears in a recent *Gazette* suggests some interesting comparisons. It gives the total value of goods imported, and of Customs duties paid in the Cape Colony and Natal respectively, during the past eight years. The extraordinary rise and fall of trade within this period is the first feature that strikes one. Imports in the Cape Colony dropped from 9½ millions in 1882, to £3,799,000 in 1886. This was a drop of nearly two-thirds in four years. In the same period, Natal imports £2,213,000 to £1,331,000, a drop of a little more than a third. The depression of trade in the Cape Colony, therefore, was twice as severe as it was in Natal. Cape imports aggregated 51 millions for eight years; Natal imports amounted to 15 millions. On the other hand, while, in 1882 our imports were barely a fourth in value of those of the Cape, in 1887, they amounted to nearly one-half the value of Cape imports. This is a surprising fact, which has not been sufficiently noticed. Through the one port of Durban, there passed, in 1887, merchandise whose value was half that of all goods passing through the three ports of Capetown, Algoa Bay, and East London, to say nothing of minor places. It is to be noted, however, that, of the eight years in Natal, the imports for the first, or 1880, reached the highest point, £2,336,000 against £2,263,000 last year. In 1888, the rise promises to be considerably greater. Looking at the Revenue returns, we find that the aggregate charge in the Cape Colony was about 15 per cent. in 1880, 20 per cent. in 1884 and 1885, 23 per cent. in 1886, and all but 20 per cent. in 1887. In Natal, the average charge keeps with singular steadiness at 10 per cent., the revenue last year having been £226,597 on an import value of £2,263,920. It follows, of course, that the proportion borne by our Customs revenue to that of the Cape Colony is less by one-half than the proportion borne by our trade to theirs. Natal is thus shown to be the most lightly taxed of the two Colonies, whether as regards direct or indirect taxation; and it is the fact that we are so lightly taxed that enables us to reduce taxation to a yet lower point." In the same issue, the *Mercury*, treating of the returns of the Cape Customs for this year, says:—"The three-quarterly Customs returns show that the trade of Natal is still bounding forward. The advance on last year's imports is more than one-fourth, being £439,738. Should the same ratio be maintained, our imports in 1888 will have reached a value of £2,783,000, or more than half the whole Cape imports for 1887—a marvellous and most singular result. The Customs revenue has been £38,000, or 25 per cent. in excess of that for 1887, or £28,000 in excess of the estimate for the whole year, which was set down at £180,000. Should trade keep up, as seems likely, the Customs receipts for the year will show an advance of more than 50 per cent. on the estimate. This advance, we must also bear in mind, will be reflected in the railway earnings. Exports also show surprisingly satisfactory results. For the nine months, they have been £955,216, against £744,948 for the whole of last year, and they are nearly half the value of the imports. Gold contributes £273,831 to this sum total, against £88,435. The combined trade of the colony for the past three-quarters of the year reaches a total of £3,048,793. There seems every probability that the total trade of the whole year will exceed four millions. Such leaps and bounds have few parallels, except in the cases of California and Australia, after the first discoveries of gold there."

The Woollen Industry of Belgium.

The following statistics show the imports and exports during the first ten months of the last three years in the Belgian woollen industry:—

IMPORTS.	1888.	1887.	1886.
Woollen Yarns—	Kilos.	Kilos.	Kilos.
October	78,580	84,950	81,750
Ten first months	742,770	710,850	700,120
Whole year	—	851,780	852,950
Woollen Tissues:—Coatings, Duffels, and other heavy cloths—	Francs.	Francs.	Francs.
October	215,390	178,160	193,240
Ten first months	1,400,900	1,391,040	1,523,350
Whole year	—	1,686,390	1,748,370
Light Tissues—			
September	1,577,330	1,530,580	1,403,780
Ten first months	14,023,970	13,843,300	13,131,580
Whole year	—	15,759,380	15,022,760
Woollen Tissues:—Cashmeres and similar cloths—			
October	206,320	161,670	264,510
Ten first months	1,866,020	2,549,910	2,928,410
Whole year	—	2,855,660	3,315,620

EXPORTS.	1888.	1887.	1886.
Woollen Yarns—	Kilos.	Kilos.	Kilos.
October	971,810	857,670	1,589,860
Ten first months	9,890,700	9,336,180	9,347,710
Whole year	—	11,581,180	11,224,940
Woollen Tissues:—Coatings, Duffels, and other heavy cloths—			
October	12,460	13,680	31,660
Ten first months	214,780	172,800	199,270
Whole year	—	225,120	255,420
Light Tissues—			
October	37,540	48,710	34,780
Ten first months	538,040	441,670	405,470
Whole year	—	502,570	464,700
Woollen Tissues:—Cashmeres and similar cloths—			
October	71,090	95,640	67,940
Ten first months	1,188,910	1,197,040	1,145,810
Whole year	—	1,434,260	1,370,400

Mr. S. C. Lister on Silk Culture in India.

The Indian Government has recently appointed an official charged with the supervision of the silk cultivation industry in India. This gentleman, Mr. Munkerji, wrote to Mr. Wardle, the president of the Silk Association of England, a letter in which he gave expression to certain opinions upon the prospects of silk cultivation which are at variance with the experience of Mr. Lister, who, it is well known, is an extensive grower of silk on his estate in India, and Mr. Lister has just written the following letter to Mr. Wardle, in which he states the grounds upon which he differs from Mr. Munkerji. Mr. Lister says:—I have read with great interest Mr. Munkerji's letter to you, published in the report of the Silk Association. You are already aware that it was not my intention to have said or done anything with regard to my sericultural experiments in Dehra Dùn and the Punjaub, until the coming crop had been ascertained; but, as we have now got an official appointed by the Indian Government, and as time is of importance, I have thought it might be of use if I shortly and roughly sketched out what has already been done, and also what I think might be done, to maintain and develop sericulture in India It is evident that Mr. Munkerji has much to learn when he says "again, it is an industry which must necessarily be in the hands of native peasants," &c.; and further says, "and it is impossible for foreign capitalists, with hired native labour, to succeed in this industry." Such, then, is the opinion of Mr. Munkerji to-day, and such may be said to be the universal opinion, that sericulture is impossible on any other lines than those which have been followed for thousands of years in all silk-producing countries, both in Europe and in Asia; and yet, with all this weight of authority against me, backed up by the experience of ages, I am prepared to demonstrate, to show and to prove, beyond all question and doubt, that labour guided and controlled by capital and knowledge, can produce cheaper and better silk than has hitherto been done by cottage cultivation. Thus you have the diametrically opposite opinions and opposite systems: and time and experience can alone show which is right. I have tried both systems, and have paid dearly for my learning, and, therefore, can speak with some authority; and I am fully persuaded that this great problem is now completely mastered, and that the future of sericulture in India is thereby assured. Nothing, therefore, could give me greater pleasure than that Mr. Munkerji, or any other official, should go and see for himself what is being done at Lister's Grant, and examine and test everything relating to the cost and the quality of the silk produced. If his report is, as I believe it will be, satisfactory, then another year I should propose that the Silk Association should send someone along with a Government official, and should again examine and test everything relating to the cost and quality of the silk produced, and so prepare the way for its being carried out on a much larger scale by British and native capital. The time for the silk crop is close at hand, and, from its commencement in the first or second week in February, only requires from thirty to forty days to complete it, so that either Mr. M , or some other expert appointed by Government, might easily devote a month to testing the results. A considerable portion of the mulberry plantations are now in fair bearing, and surround the rearing-houses, and we are provided with seed of the first quality, being the produce of Italian and French breeds, reared on the estate, so that there should be and can be no difficulty in testing everything. For this I have patiently worked year after year, and at last the time has come. I have said, give me a fulcrum, and I can move the sericultural world. Give me labour, sufficiently trained, seed free from disease, plantations of sufficient age, and rearing houses adapted for the purpose (and without this it is all labour in vain), and then there can be no difficulty in obtaining the most positive, accurate, and undeniable results. There are certain things of great importance that we have already tested and proved—first, that disease, when the worms are properly fed and attended to, is unknown to us; second, that the seed of the Italian and French Bombyx Mori, reared in the Dùn, gives just as good cocoons as in Europe, and, so far, does not appear to degenerate. Last year, we compared the two, and found that the cocoons raised from our own seed were quite as good as those from imported European seed. We have, therefore, ceased to import any, and rely altogether upon our own; and last year, Mr. Ferrant, the manager, to whom much of our success is due, in a small experimental way raised four crops of the ordinary Polyvoltine Bengal sort, without so much as losing a worm. Such have been the results of intelligent and careful cultivation, and I am perfectly satisfied that disease, about which we hear so much, is only another name for ignorance, neglect, dirt, and rearing-houses altogether unsuited for the purpose. I am not proposing to write a treatise on sericulture (I must leave that to those who have more time at their disposal); but the whole art and mystery may be expressed and enforced in three or four simple rules—first, sound seed; second, air, space, and cleanliness; third, regular feeding; fourth, suitable rearing-houses. And where do you find these conditions in the native cottage? I have never seen anything of the kind; they may exist, but, I again say, I have never seen them. Air, space, and cleanliness the worms must have, or disease is certain. Then comes regular feeding, and at night, if possible, as we find that the worms are healthier, spin sooner, and make much finer cocoons, with night feeding. Mr. Bose, secretary of the Gurdaspur Board, is right when he says (and he has evidently taken infinite pains):—"My own impression is that the prevalence of disease was far more owing to the want of care, the negligence and general ignorance which prevail among rearers, than anything else." At last, the Government officials are beginning to find out what I have long since discovered, that it is impossible to rear silkworms in dirt accompanied with neglect, and he says:—"They never care to make the rearing-houses airy, and to keep them clean." Under such conditions, I am clear that sericulture is impossible. Give what prizes you will, it is all money thrown away. Mr. Dane, Deputy Commissioner, Gurdaspur, says:—"The first prize for foreign seed cocoons fell to Lister and Co.;" and further on he says—"it seems somewhat absurd" (I should think it does) "to award over Rs.1,000 worth of prizes for a total out-turn of silk of such trifling value, viz, Rs.6,415." And what is more, if they gave every shilling in the Indian Treasury they would not be one bit nearer. All the wealth of India can never make silkworms thrive in the hands of dirty, careless, ignorant native rearers. I have paid for my learning, as for several years I joined the Government in giving prizes; but I soon saw that it was a perfect waste of time and money. Then it was that I determined to try what could be done by having everything carried out in a proper business like manner; and I am now, as I think, on the point of having a great success, after years of trouble and expense. Just a word with regard to cottage cultivation, and then I have done. Where mulberry trees abound and the climate is suitable, cottage cultivation should be possible, provided the native rearers are supplied with sound seed, and, above all, are taught how to use it. A certain number of intelligent trained rearers, going from house to house, might soon bring about abundant success; but it is quite useless to offer prizes to men who know nothing of sericulture, and who are totally ignorant of the fundamental fact that silkworms cannot be reared excepting with sufficient air, space, cleanliness, and regular feeding

The New Patents, Designs, and Trade Marks Act, 1888.

The chief features of the new act are as follow:—After the 1st day of July, 1889, no person shall be entitled to describe himself as a patent agent unless his name has been placed upon an official roll which will be provided for this purpose. Those practising as patent agents before the passing of the Act will be entitled to entry on this roll, but, in future cases, the Board of Trade is empowered to make such rules concerning qualification as will give effect to the Act. The next alteration empowers the Comptroller-general to refuse acceptance of an application which does not, in his estimation, comply with the rules, or which does not sufficiently describe the invention. In such a case, the application will not receive a date until the Comptroller's requirements are complied with. This feature in the Act will, no doubt, tend to prevent the scandalously imperfect adumbrations which are frequently filed as provisional specifications, the language of which is sometimes vague enough to permit of almost any interpretation when the complete specification falls due to be filed. Another advantage of this clause is that it will probably tend to defeat the object of a hastily filed and imperfectly understood sketch of an idea, perhaps, fraudulently snatched from another. One objectionable and, as it seems to us, retrogade step in the new Act refers to the discontinuance of the examiners' reports upon concurrent applications; but an undoubtedly valuable addition to the grounds upon which the grant of a patent may be opposed is that whereby such opposition may be founded upon the contention that the complete specification describes or claims matter in excess of the provisional specification, such excess matter forming the subject of an after application by the opponent. As far as the opposing of patents is concerned, it is, in our opinion, an omission in the Act that no provision has been made for the rebutting of opposition founded upon a claim manifestly absurd, and clearly not sustainable in a court of law. As matters stand, inventors are still liable to encounter this hardship. With reference to the "designs" portion of the Act, an important concession is made in so far as, when registration of a design is refused, the disappointed applicant is entitled to inspect the design upon which the refusal is based. In the trade marks section, the vexed question of what is, and what is not, a "fancy word" is, we hope, set at rest. A trade mark may now consist of "an invented word or invented words, or a word or words having no reference to the character or quality of the goods, and not being a geographical name." Thus, in future, merchants will be able to register as a trade mark a word arbitrarily chosen, but not necessarily new, a privilege from which they have been debarred under the original Act

The Vice-Consul of France, in Tripoli, gives the following advice, with regard to the trade in silk and the cocoon harvest, to merchants trading with the Levant:—"The condition of the silk trade in France, and the great losses sustained by local manufacturers last year, made some of the silk-winders of Tripoli very cautious, while others, speculating on a rise, and hoping to recoup themselves, did not hesitate to take in a supply sufficient to last them all the year. Some of these latter bought in again, at Marseilles, an important part of what they sold the previous season. It is therefore desirable that home manufacturers should be extremely cautious in their dealings this year with the silk-winders of Tripoli."

Original Designs.

Our first plate shows a design for Printed Muslin for curtains and such purposes. It is also suitable for printed blinds.

* * * *

On our second plate, we have a design for a Silk Handkerchief, which would be effective if woven in three colours.

* * * *

We give a design for a Counterpane on our third plate. These designs have been drawn by Mr. R. Lord, 10, Ann Place, Bradford.

Monthly Trade Reports.

WOOL.—There has been a fair consumptive demand for various kinds of wools. Staplers generally have asked advanced rates and, unless these have been paid, have held their stocks. The closing week of the year was rather quieter with regard to new orders for yarns and pieces. Both spinners and manufacturers are fairly well employed on orders that will last them for some little time, and there is no anxiety to book new orders except at higher prices; in botany yarns, there has been a decided advance. In the fancy kinds of yarns, much business has been done during the year, and December showed about an average demand. On piece goods, looms, both broad and narrow, are fully employed, and manufacturers are sanguine of a continued good trade during this year.

COTTON.—The markets for the raw material have been about average ones, the sale being on a par with any preceding month during the year. Yarns generally have been firm in price and, with the exception of the last week in the year, fairly good orders have been booked. Common counts of yarns have ruled a shade quieter, but prices have kept moderately firm. Egyptian yarns have been higher, the Bolton difficulty having had an effect on them. Cloth manufacturers report fair orders for India and China, and rather higher rates, in fact, new business has been generally refused unless good prices have been offered. Order books are pretty well filled for the next few weeks, and those engaged in the various cotton branches are sanguine of a fair trade for some little time. In some districts, there are exceptions, but, on the whole, the cotton trade is in a fair condition.

WOOLLEN.—The state of this branch of industry has varied but little from last month. Looms are generally well employed, and, in many cases, overtime is still being run. The demand for worsteds of a good quality of material, and of effective designs, is satisfactory, and prices have been very firm—the same may be said of the various makes of cloth for the ready made clothing trade. New patterns are now being prepared to show for next winter's trade, and the feeling is of a cheerful nature as to the success of these. Stock-taking has been general and, judging by reports, manufacturers of woollens are not disappointed as to the result of their year's trade.

LINEN.—There has been a fair business doing during the month, with the exception of the closing week, and the outlook for this year seems fairly bright. Damask table linens and such like fancy goods have had a rather better demand, and the same may be said of towelling, toilet covers, tea cloths, &c. Drills and sheetings have had about an average sale. There is much complaining still about the low prices obtainable for nearly all classes of goods, the margin of profit being almost *nil*.

LACE.—There has been a rather better feeling during the month in the lace department, and manufacturers have grounds for hope that a revival of trade will shortly take place. On all sides, the complaint is of the existing low prices, and manufacturers who are now busy on new articles affirm that it is almost impossible to realise a profit on their transactions. The curtain trade has improved, as has two or three other branches of the industry. There is nothing new to report of the Lever's branch.

Postal Notices.

ROUMANIA.—Parcels not exceeding 7 lbs. in weight are now received at any post office in the United Kingdom for transmission to Roumania. *Rates of Postage.*—For a parcel not exceeding 3 lbs. *via* Cologne, 2s. 5d., *via* Hamburg, 2s. 1d. For a parcel exceeding 3 lbs, but not exceeding 7 lbs., *via* Cologne, 2s. 10d., *via* Hamburg, 2s. 7d. No parcel must exceed 2 feet in any direction.

CAPE OF GOOD HOPE.—The postage on parcels to the Cape of Good Hope has been reduced to the following rates:—*To Cape Town.*—Not exceeding 1 lb., 9d., for each pound or fraction of a pound additional, 9d. *To any place in the Cape Colony other than Cape Town.*—Not exceeding 1 lb., 10d.; for each pound or fraction of a pound additional, 1s.

CEYLON.—The postage on parcels not exceeding 11 lbs. in weight for Ceylon has now been reduced to the following rates:—not exceeding 1 lb., 9d; for each pound or fraction of a pound additional, 6d. Parcels for Ceylon are despatched from London every Wednesday morning. No parcel must exceed 3 ft. 6 in. in length or 6 ft. in length and girth combined.

Alizarine Red on Cotton Yarns.

For the finest shades of red and for pinks, it is customary to use bleached yarn. The natural yellow of the cotton dulls the shade, but grey yarn is sometimes used where fast, but not very brilliant, shades are desired. A single soap or soda boil is sufficient to produce results nearly as good as can be obtained by a full bleach. The quantity of materials used to produce a full red is about as follows:—Cotton, 100 pounds; alizarine assistant, 10 pounds; red liquor, 5 gallons; arseniate of soda, 5 pounds; alizarine, 10 pounds, of 20 per cent. paste; acetate of lime, 1 pound. The cotton is worked for ten minutes in 10 per cent of alizarine assistant or soluble oil, diluted with 35 gallons of water It is wrung with great care, usually dipped a second time and wrung a second time. It is then taken to the dry room and aged for 24 hours at about 110° F. The bath of alizarine assistant can be strengthened and used repeatedly. The next day it is worked for thirty minutes in red liquor (aluminum acetate) at 10° Tw., wrung with great care, and aged again, best for twenty-four hours. The time of drying can be much reduced without seriously affecting the shade. A single treatment with assistant and red liquor is not sufficient to fix as much mordant upon the fibre as is necessary for the production of a full red. It is usually necessary, therefore, to repeat these two processes to obtain the best results. For the cleaning of the yarns, a solution of arseniate of soda containing 5 per cent. of the weight of cotton is used best at a temperature of about 130 F. The necessary per cent. of alizarine paste is carefully worked into cold water in the tub, The quantity of water is not material. Acetate of lime is added, as lime is a necessary constituent of the colour lake. The yarn is entered cold, and raised in one hour to a boil. The dyeing should be very slow, and two hours can be used to advantage. The bath should be exhausted. The yarn should be constantly turned during the dyeing. The yarns should be worked in cold water, and taken to the steaming-box. They should be steamed for 30 minutes. Ten pounds pressure is sufficient to give good results. The steam should be dry. After the steaming, the yarns should be given hot soap until they bleed no longer. This process will not tender the yarns, and any weakness which they may show will be due to careless bleaching. Of course, impurities in the substance used might possibly injure the yarn.

Commercial Energy and Tactics at St. Etienne: a Hint to Great Britain.

An Association has recently been formed at St. Etienne for the purpose of establishing an industrial museum on a new principle, which will, no doubt, tend to promote the interests of manufacturers and merchants far more than other exhibitions, which often seem to have been organised for the benefit of the curators rather than for that of the public. In St. Etienne, if manufacturers or merchants wish to know what their competitors in the principal centres are doing, or to be informed of the requirements of any market at a given time, they need only communicate with the curator by telephone or letter, and, in an hour afterwards, the required patterns will be sent to the office of the firm, accompanied by full particulars as regards price, port of shipment, and custom-house regulations. The museum will, of course, contain the best specimens of ribbons and passementerie manufactured at St. Etienne, as well as samples of all the principal textile fabrics of the world, which will be renewed every season. The museum will also comprise an extensive library and a collection of photographs and drawings bearing on industrial art, and it will be open free to the public, though it is necessary to become a member and pay a small annual fee in order to have the articles sent to the manufacturer.

Messrs. Alexandre and Sons have patented in France the following mixture for scouring purposes:—510 litres of water, rendered caustic by the use of soda or potash at 12 degrees, are put into a boiler heated on free fire, along with 300 kilos. carbonate of soda, 50 kilos. olive oil, 50 kilos. olive of grape seed, 50 kilos. palm oil, 15 kilos. animal size, 15 kilos. colophonium, and 10 litres ammonia water. The compound is agitated by suitable means, and left to boil until a complete emulsion is formed, when 8 kilos. of common salt are added, and the boiling is continued until the mass is coagulated, then it is drawn off by a tap, placed at the bottom part of the boiler upon trays, where it is allowed to remain for a few hours in order to become cool. It is then a compact mass, and is ready for use.

PRINTED MUSLIN.

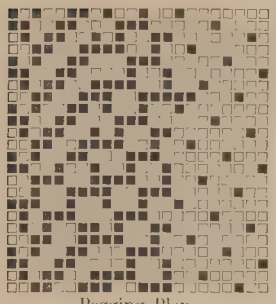
SILK HANDKERCHIEF.

COUNTERPANE.

Fashionable Designs.

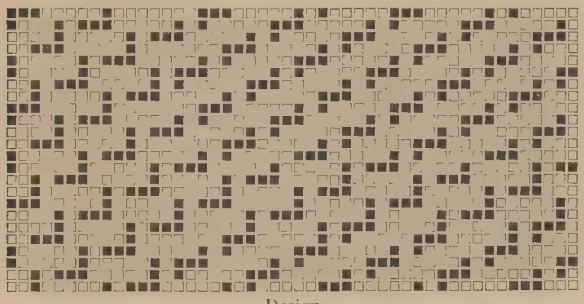
Worsted Suiting.

No. 561.

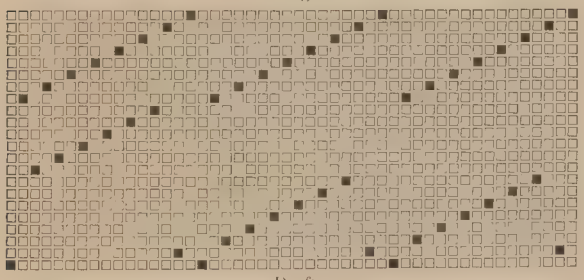


Pegging Plan.

6,720 ends in warp; 104 ends per inch; 13's reed; 8 ends in a dent; 60 picks per inch; 64¼ inches wide in the loom; 56 inches wide when finished. Weight, 25 ozs.



Design.



Draft.

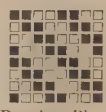
Warp:—1 end face, Red and Black twist, 2/28's worsted.
1 „ back, Black, 18 skeins woollen.
1 „ face, Green, 2/28's worsted } 4 times.
1 „ back, „ 18 skeins woollen }
1 „ face, Red and black twist, 2/28's worsted.
1 „ back, Black, 18 skeins woollen } 13 times.
1 „ face, „ 2/28's worsted }
1 „ back, „ 18 skeins woollen.
1 „ face, Green, 2/28's worsted } 4 times.
1 „ back, „ 18 skeins woollen }
1 „ face, Black, 2/28's worsted } 8 times.
1 „ back, „ 18 skeins woollen }
1 „ face, Green, 2/28's worsted } 4 times.
1 „ back, „ 18 skeins woollen }
1 „ face, Black, 2/28's worsted } 13 times.
1 „ back, „ 18 skeins woollen }

Weft:—1 pick Blue and Black twist, 2/30.
4 picks Brown, „
1 pick Blue and Black twist, „
13 picks Black, „
4 „ Brown, „
8 „ Black, „
4 „ Brown, „
13 „ Black, „

Woollen Trousering.

No. 562.

Design.



Pegging Plan.

Draft.

Warp:—4 ends Black, 3/27 skeins woollen.
6 „ Grey, „ „
1 end Twist, „ „
5 ends Grey, „ „

Weft:—All Black, 3/24 skeins woollen.

1,488 ends in warp; 24 ends per inch; 6 reed; 4 ends in a dent; 24 picks per inch; 62 inches wide in the loom; 56 inches wide when finished. Weight of cloth 22 ozs.

Mantle or Costume Cloths.

No. 563.

Design.

1,984 ends in warp; 32 ends per inch; 16's slay; 2 ends in dent; 33 picks per inch; 62 inches wide in the loom; 56 inches wide when finished.

Weight of cloth, 8 ozs.

Warp:—12's worsted.

Weft:—14's worsted.

No. 564.

Design.

1,984 ends in warp; 32 ends per inch; 16's slay; 2 ends in a dent; 33 picks per inch; 62 inches wide in the loom; 56 inches wide when finished. Weight of cloth 8¼ ozs.

Warp:—14's worsted. Weft:—13's worsted.

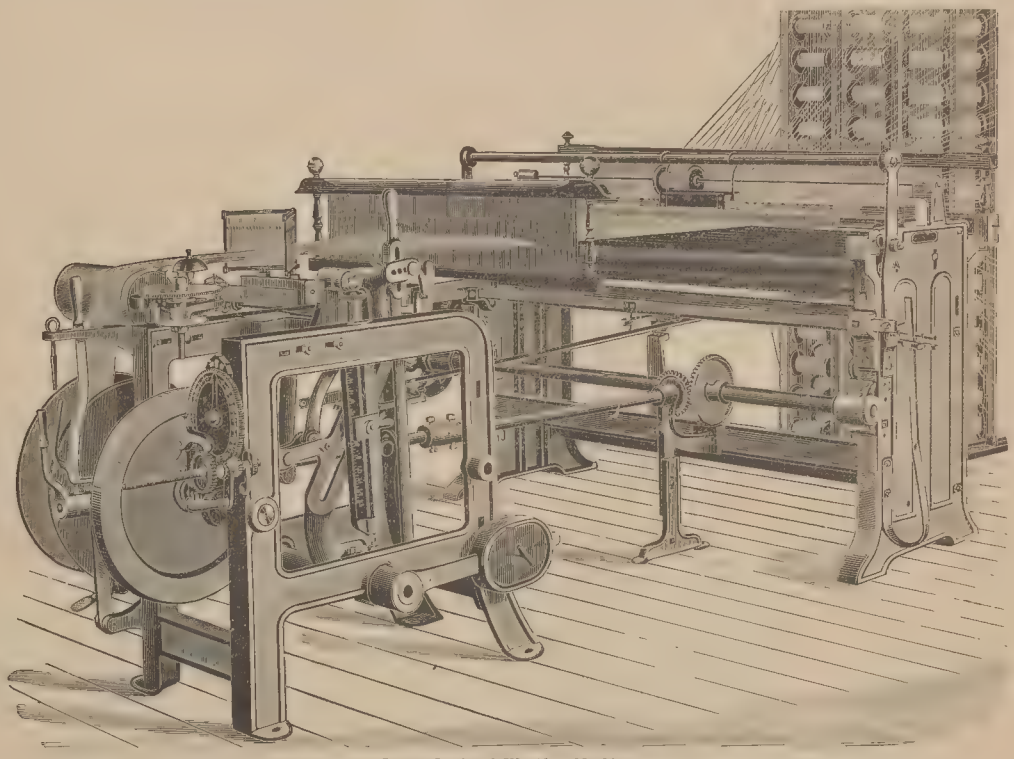
John Petrie, Junr., Limited, Machinists, Rochdale.

The old established, and well-known firm of John Petrie, junr., wool washing machinist, River Street and Baron Street, Rochdale, is being made into a limited liability company. The business, which was established some 35 years ago in a small way, has been gradually built up until, at the present time, a very lucrative return for the capital invested is being made, and, judging by the success that has attended Mr. Petrie in the sales of his machines in the past, the new company has every prospect of paying good dividends in the future. For some time past, Mr. F. W. Petrie has acted efficiently as managing partner of the concern, and his services will be retained, so that the shareholders will have the benefit of his management in the various departments of the business. Mr. John Petrie (who was the inventor of the first successful wool scouring and drying machine) has, during his career, patented some dozens of inventions in connection with his machines, and many of these patents have still some years to run, and these, along with any new patents that may be taken out, become the property of the shareholders. The prospectus which has just been issued, puts the share capital at £25,000, but only 1000 six per cent. permanent preference shares of £10 each will at present be issued, 300 of which are allotted in part payment to Mr. Petrie, and 700 are offered to the public; as from the audit the books show an average profit of over £1,600 per annum for the last seven years, these shares should be a very safe investment, and, no doubt, they will be speedily taken advantage of, as the guarantee given by the above statement of profits will be ample for the most careful of investors. The share list closes on the 31st of January, and application may be made to the Manchester and Liverpool District Banking Co., Limited, Rochdale, or to any of their agencies, or to John Petrie, junr., Limited, River Street, Rochdale.

MACHINERY, &c.

Improved Sectional Warping Machine.

In former issues of our Journal, we have given particulars of various improvements that have been made in sectional warping mechanisms by Mr. J. H. Stott, Baron Street, Rochdale. These improvements have greatly increased the utility of this class of machine, so that Mr. Stott's specialities are now generally conceded to be the most useful in the market. Recent experiments have been made, with a result of further improving these machines in the setting and regulating motions, and also, in addition, the value of the machine has been enhanced in several minor points. The machine, as a whole, stands as formerly, as will be seen from the annexed illustration, still it will be necessary for us to give in detail the alterations made upon the hitherto existing mechanism. These alterations consist principally in the manner in which the presser and friction bowl are controlled, the curved levers, with the weight sustained by them, being removed—and replaced by a simple and ingenious arrangement of levers, which are few in number, with a consequent absence of complication. The section block is, as in earlier machines, driven by a friction bowl sliding upon a horizontal shaft, and connected by a forked lever to a shaft which is rocked by the regulating screw by means of an L lever coupled to the latter. On the presser shaft, which extends across the machine, is a cranked slotted lever, also connected, as is shown in the illustration, to the regulating screw which is operated as before by a ratchet. An indexed regulator plate is fixed as shown, behind which is a star wheel indicating the number of hundreds of revolutions. As this part of the mechanism is substantially unaltered, it is not necessary to further describe it. A pin fixed in a brass nut, sliding in a graduated slotted lever which adjoins the cranked lever, engages with the slot in the cranked lever. The position of the nut is adjusted by means of a screw on which it fits and which extends downwards in the slot. The upper end of the screw has a hand-wheel fastened on it, so that it is easy to set the nut as required. The graduated lever swings on a pin, is cranked at its upper end, and has a pin fixed at the end of its cranked end. A hand lever, which is pivoted at its lower end to a lever on the presser shaft, is formed with a slot at its upper end, one side of the slot being provided with a recess with which the pin in the graduated lever engages. The lever on the presser shaft is arranged to come in contact with an arm fixed on the shaft, and in this way the necessary depression of the presser arm is obtained. The action of this mechanism is as follows:—The section block being empty, the presser is in its highest position, and the friction bowl is pushed in to its initial position. In this case, the cranked lever is drawn forward by means of the screw, and it and the graduated lever are then practically parallel. As is well known, the practice is to form a trial cheese so as to be sure that the mechanism is in its proper position to produce sections of the requisite length and properly wound. One of the features of the new arrangement requires special explanation. As has been pointed out, the hand lever is slotted at its upper part, and in beginning to form a trial cheese, a hundred yards or so are first run on to the barrel, the graduated and hand levers being disconnected. If the nut is properly set, the pin fastened in the horizontal arm of the graduated lever can slip into the recess, or the hand lever can be easily pushed on to the pin, but, if not, the nut is moved in the slot until the pin will slip in, after which it is locked. By noticing the position of the nut, a record is obtained of the various points at which it should be set for sections of various counts. This is a valuable feature, and is sure to be appreciated. The operation of the rest of the mechanism is obvious. As the building of the cheese proceeds, the cranked lever is pushed inwards, the graduated lever is also swung on its centre, and the necessary withdrawal of the presser and friction bowl is thus readily obtained. By reason of the interdependence of the whole of the parts, the pressure put upon the cheese is constant, while the withdrawal of the friction bowl is effected at the exact speed required. The machine is very simple and easily understood, and no difficulty should be experienced by any warper in manipulating it. In construction, the machine is all that can be desired. It will be especially valuable to manufacturers of coloured warp goods, and also to makers of balled warps. Mr. Stott will give further particulars and prices, &c., on application.



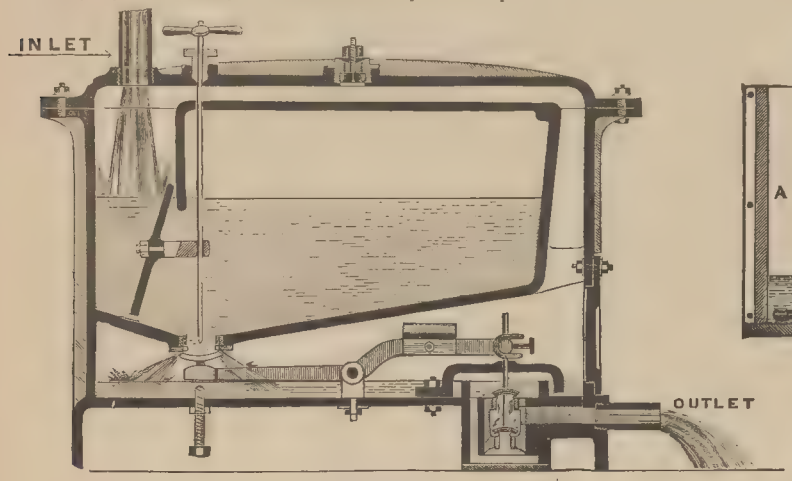
Patent Sectional Warping Machine.

Appliance for Examining the Underside of Cloth when being Woven.

A simple device for examining the underside of cloth when being woven has been patented by Mr. J. Irving, of Barnsley. It consists of placing a mirror in such a position with regard to the cloth being woven that the weaver is able at any time (even whilst the loom is in motion) to see the underside of the same by looking in the mirror. The mirror also reflects the light from above on the underside of the cloth, rendering any imperfection more apparent. We cannot speak of the merits of the contrivance, but in some situations it ought to answer the purpose for which it has been invented.

The "Wuff" Patent Steam Trap.

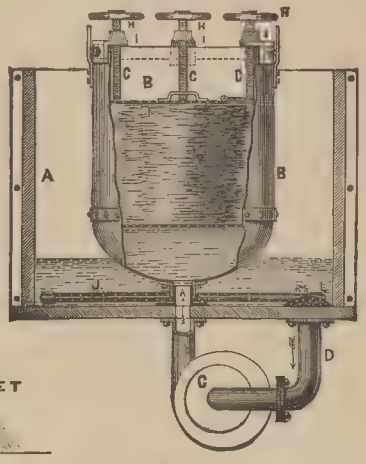
Users of steam have, for years past, had innumerable patterns of steam traps brought before their notice, that have, as a whole, been of advantage to them, but, like mechanisms in general, many of these that have been in use for some years, if compared with newer productions, show a decided want of effectiveness, and by many users are considered almost useless. The types which have been generally conceded to be the most successful are rectangular boxes, containing hollow metal floats that actuate an outlet valve as the water accumulates, and again close it as the water decreases. Enclosed metallic expansion tubes, and opening and closing valves, have also been much used, but in some respects both these types have been found wanting. For some time past, the "Wuff" Patent Steam Trap Co. of Globe Road, Leeds, have been carrying on experiments, the object being the making of a steam trap which, for simplicity of mechanism, and effectiveness in work, should be ahead of those generally produced, and in this they claim to have succeeded, and to be able to furnish a trap that in price will compare favourably with the usual trade rates. The illustration gives a view of the various parts of the trap, which consists of an iron vessel, specially constructed to withstand high pressures. This vessel has a suitable inlet and outlet, and has a moveable cover for access to the body of the trap. A small hand-hole cover is provided in the side to allow of adjustment. The working is simplicity itself—the weight of water gradually increasing in the body of the trap, eventually exceeding the weight of the balance on the lever, the single valve is forced open, allowing the water to enter the bottom of the trap. Simultaneously with the opening of the single valve, that of the double or equilibrium valve takes place, which ejects the water through the outlet. An automatic air valve is provided in the cover, for ejecting any air which may accumulate in the body of the trap or connecting pipes. A test handle also is provided, which allows of the valves being opened and steam blown through for cleansing purposes. It will be seen that all ball-valves or floats are entirely dispensed with, and the "Wuff" Co. claim that this trap is made on a thoroughly correct principle in every respect, and embodies every requirement for ensuring a perfect and reliable steam trap.



The "Wuff" Patent Steam Trap.

Machine for Dyeing Fibres in a Loose State.

There are various kinds of apparatus now in use for the dyeing and otherwise treating wool and other descriptions of textile fibres in a loose state, the chief object being the conducting of the operations in such a manner that the fibres acted upon leave the dye vessel without being entangled or felted. By the use of some of the apparatus now in vogue, a great saving in time and material, with a lessening of waste, has been the result, and, to further enhance the capabilities of existing machines, experiments are continually being made by machinists. One of the latest—and perhaps most effective—improvements has been patented by Mr. J. Walker, Dyer, of Dewsbury, and is now being manufactured by Mr. John Petrie, Junr., machinist, of Rochdale, who is the sole licensee, and is now well known at home and abroad for the excellence of his wool washing and drying machines, and for various other apparatus used in the textile industries. The improvements can be seen at a glance from the annexed illustration. An ordinary bath, or dyeing vessel, is used as at A, and in this is placed an open ended vessel B, made of copper or any other suitable material. An opening is made at the bottom of the vessel, and a connection is made by joints or stuffing boxes *a* to an inlet pipe and centrifugal or other pump C, which communicates by the pipe D with the outer vessel A. Inside, and near the bottom of the vessel B, is placed a perforated plate E for the fibre to rest upon, whilst another perforated plate F, is used for the purpose of placing upon the fibre, after which, when the operation of dyeing has to be carried on, it is screwed down to a required degree of pressure by screws G, and handwheels H, which work through nuts or brackets I. The dye is introduced into the outer vessel A, and the boiling process is effected by means of a perforated steam pipe J, placed near the bottom of the vessel. When the fibre which has been placed between the perforated plates E and F has to be dyed, the pump C is set in motion, in order to draw the liquor through the perforated grate *b*, and upwards into the bottom of the vessel B, and it is carried through the plate E, then through the fibre and the plate F, and, finally, over the top of the vessel B, from whence it falls into the outer vessel A. By these means, a continuous stream of dye liquor can be forced through the fibre until it is sufficiently dyed. In order to ensure an average and equal shade of colour being given to the fibre, the perforations in the bottom and top plates E and F are made of equal size and area, and in order also to prevent the liquor from ascending vertically and out again at the top without an average and equal distribution amongst the fibres, the perforations in, or near, the centre of the top or bottom plates, or both, can be of smaller area than the perforations at, or near, the outer edge of the said plates, for the purpose of retarding the exit of the liquor at the centre, thereby allowing, or causing, the liquor to expand outwards so as to equalize the dyeing or otherwise treating of the fibre. Instead of forcing the liquor through the perforated plates and through the fibre as above explained, the liquor may be drawn by suction, or these operations of forcing and drawing the liquor through the fibre may be alternately performed. When dyeing slubbings, rovings, or other partly manufactured fibres, such as the coiled sliver received from carding engines, &c., they can be placed in a suitably shaped vessel, and the liquor forced or drawn through as already explained. By this means, the sliver can be taken back again without its position being disturbed, or without becoming entangled or felted, whereby the sliver or slubbing can be taken in a dyed state back again to receive the usual and subsequent operations, which will be found of considerable advantage over other methods at present in use. Mr. Petrie will be pleased to give full particulars of the apparatus which, we may add, can be adapted to existing dye vessels at a reasonable outlay.

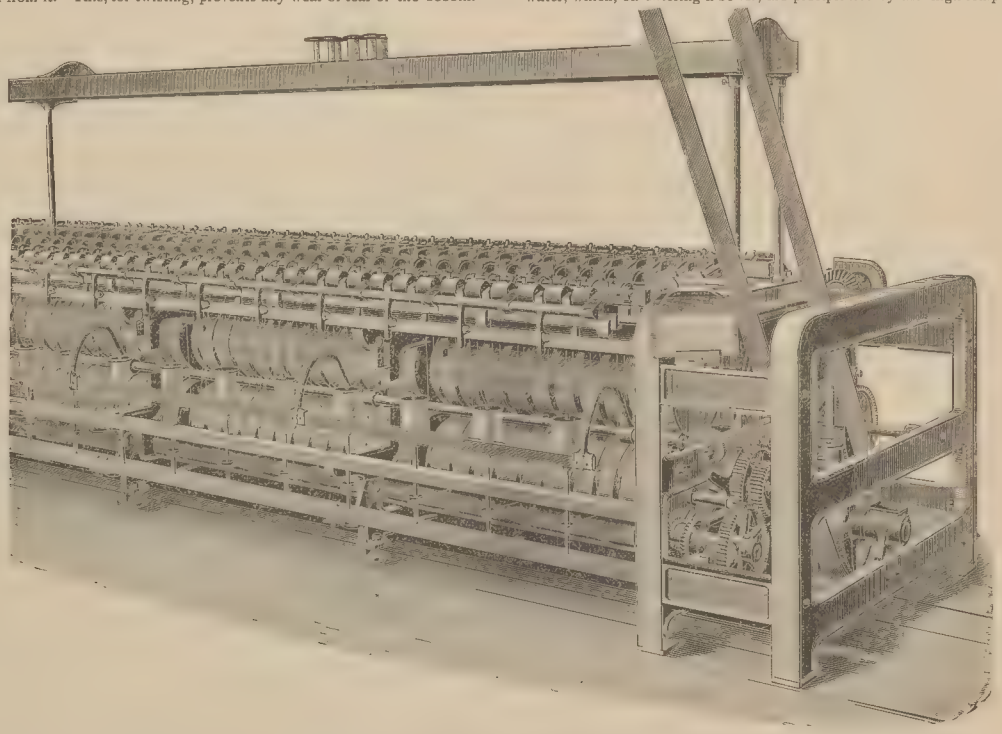


Machine for Dyeing Fibres in a Loose State.

Combined Twin Twist Doubling and Doubling Winding Machine.

A new and effective doubling and doubling winding machine has recently been placed upon the market by Messrs. Shepherd and Ayrton, machinists, Longsight, Manchester, which, for economy in time, space, &c., bids fair to eclipse anything yet produced in this class of machinery. The leading feature in the mechanism is to produce two turns of twist from one revolution of a twisting spindle. To get one turn of what is technically termed twist in anything requires that the material, whatever it may be, shall be extended between two points, one of which must be *fixed*, and the other free to revolve, whilst it holds the material in a direction parallel to its own axis, or at such an angle as shall not permit the revolving holder to wind on the material. In the ancient system of spinning with the distaff and spindle, the fingers of the spinner holding the rove were, in relation to the operation, the fixed point, and the axis of the pendant whorl, which was made to spin round, was the revolving point. The same principle exists in the hand spinning wheel, in the modern mule, and in all modern twisting frames. In all these, one revolution of the revolving point puts in *one* turn of twist. This, of course, will be perfectly obvious to everybody, and we only introduce it in order to render clear what follows. The peculiar result—that of two turns of twist to one revolution of the spindle obtained—is owing altogether to the principle upon which

the spindle is constructed. It is built in two sections, the lower one being solid, and the top one tubular; these sections are about equal in length and are joined near the middle. The composite spindle is then arranged not quite horizontally near the top of the frame. At its lower extremity, it is fitted with a fast wharve, and on the bolster, which is screwed into the rail, there is a corresponding loose wharve. These two wharves form the driving arrangement of the spindles, and are the equivalent of a fast and loose pulley on an ordinary machine. About the middle of the spindle, just above the juncture of the two parts, is placed a disc, the function of which is to keep the yarn clear of the cradle carrying the bobbin. Upon the spindle, and in front of the disc, is placed an oil cup, which will act as an oil reservoir, and also to catch the oil that may fall from the hollow section of the spindle. This, of course, ensures cleanliness in working. On this section, itself a tube, another tube is placed, which extends from inside the oil cup to the top of the spindle, thus forming the bearing of the cradle which receives the bobbin. This tube is attached to the cradle, and, of course, does not revolve, the tubular spindle only revolving within it. On this second tube, which may be termed the cradle tube, is placed a third, which is for the reception of the bobbin itself. The latter is loose upon the former, and upon it the bobbin fits sufficiently firm to cause both bobbin and tube to revolve together, as the doubled yarn is drawn from it. This, for twisting, prevents any wear or tear of the bobbin.



Combined Twin Twist Doubling and Doubling Winding Machine.

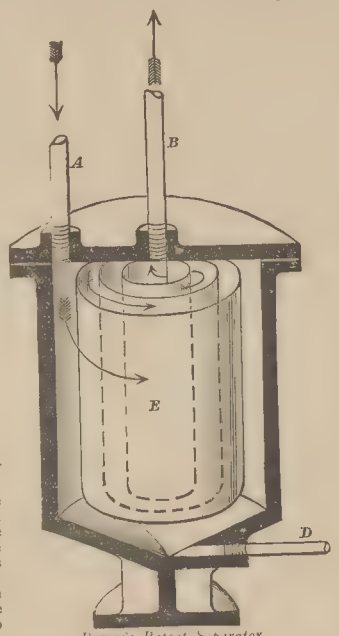
The cradle may be described as another tube sufficiently large to receive the bobbin. The upper portion of this tube is cut away, and the lower is curved in such a manner that in the drawing-off of the yarn any tendency to drag the bobbin from its position is obviated, thus ensuring uniformity of drag. When drawn off the bobbin, the yarn passes through a large eyelet in the upper part of the cradle bottom, and thence to the tip of the tubular spindle, which, revolving, gives it the first turn of twist it receives for each revolution, its natural, common, and well-known effect. From thence it passes through the tubular section of the spindle to a point below the disc previously mentioned, where it emerges at a small eyelet hole. Here comes into view the peculiarity of this spindle. This hole, holding the thread, again constitutes a *second* revolving point in this spindle, and puts in the second turn of twist. Thus the mystery is solved. From the point at which it thus emerges, the yarn is brought forward over the cradle to and around the pot rollers in the water trough, and thence along to and between the ordinary doubling rollers, after which it is wound upon sufficiently large bobbins. Our readers will, we think, conclude with us that the arrangement is a very ingenious one, entitling the inventor to great praise. The machine is fitted with a stop motion, which consists of a small hand lever. On pressing this backwards, the bands upon the spindle are controlled by the band guide, and are passed upon the loose wharve on the bolster. The same movement lifts the top doubling roller from the bottom one, and thus stops both spindles and front rollers, and prevents the drawing off of the yarn any further. The bobbin upon which the yarn is being wound is loose upon its spindle, having only a drag-washer to cause it to revolve. The peculiarity of this machine, in putting in two turns of twist for one turn of the spindle, greatly increases the production. Thus, with a spindle running at 8,500 revolutions per minute, it puts 17,00 turns of twist into the yarn at the same time, resulting, of course, in a proportionately increased turn off, or about two to one as against the ordinary machines. The arrangement, as will be seen, entirely obviates the necessity of using a drum winding machine, and dispenses with that process and its expenditure in time, space, and cost of machine and wages. Messrs. Shepherd and Ayrton are making machines on this principle, one of which is shown in our illustration.

Bowers' Patent Separator.

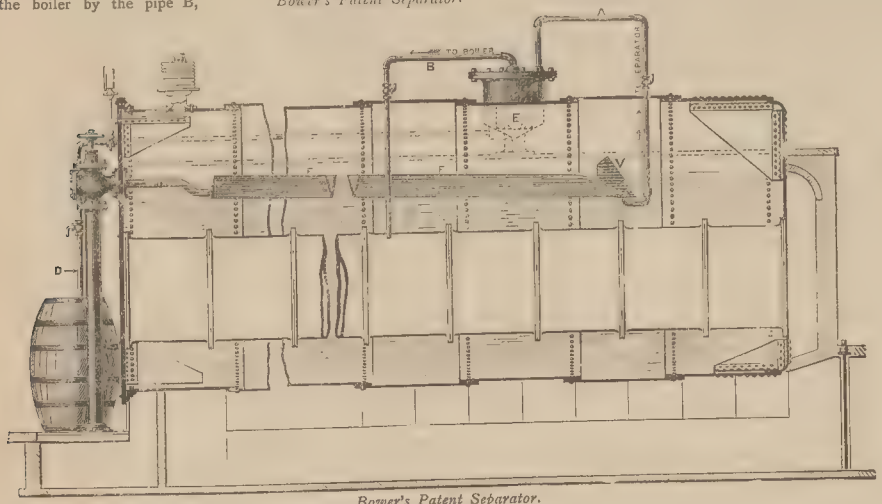
For the Automatic Removal of Mud and Deposit in Steam Boilers, the Prevention of Priming, Damage to Furnance Tubes, and the Formation of Scale.

The formation of scale and deposit in steam boilers has always been a source of annoyance and expense to steam users. It is generally known that the cause of this formation arises from the impurities contained in the feed water, which, on entering a boiler, are precipitated by the high temperature and left behind after evaporation. These impurities may be roughly classed under two heads, viz.:—those held in suspension, such as mud, clay, or vegetable matters, and those held in solution, such as the mineral salts, the carbonates of lime and magnesia, sulphate of lime, silica, &c. The behaviour of these impurities varies considerably when present in a boiler, those in suspension depositing themselves rapidly on entering, generally falling to the bottom of the boiler, whilst the lighter mineral salts usually remain suspended in the water forming a fine flour like substance, thickening the water, and hindering the free evolution of the steam, causing constant "priming" and overheating of furnace plates. Whilst it is a matter of general knowledge that the result of the evaporation of a large quantity of feed water containing much impurity is the formation of an amount of incrustation upon the plates of a boiler, which requires frequent stoppages for its removal, it is not so generally known what an amount of damage is annually done to furnace tubes by the presence of these impurities. If a boiler fed by water containing a quantity of deposit is not cleaned out at short intervals, or the water in the boiler regularly "blown off," the water becomes saturated, and causes dangerous overheating of the fire touched surfaces, becoming apparent by severe leakages at ring seams, fractured rivet holes, distorted furnace tubes, and the melting of fusible plugs. All this is easily verified by reference to the reports on boiler inspections by the inspectors of the various boiler insurance companies, or the Board of Trade. Now, it is for the removal of these injurious deposits as soon as they begin to be formed, and for their *automatic conveyance* out

of the boilers, that Bowers' Patent Separator has been devised, with what success may be estimated by the fact that, though the company which has introduced it to the notice of the steam using public is not two years old, there are more than 200 at work in the United Kingdom alone, and from the highly gratifying testimonials which Messrs. G. W. Allen and Company have received from some of the most influential manufacturing firms in England. The following is a description of the apparatus:—In order to intercept impurities before they have time to settle in the quieter parts of the boiler, a sheet iron scum plate V, and a trough F is used, the scum plate being fixed diametrically across the interior of the boiler at the water level. It is shaped like the letter V—its centre, or apex, communicating with the separator C, by means of the flow pipe A. The trough F has a converging mouthpiece secured to the scum plate V, the other end being attached to the feed pipe of the boiler. The feed is thus delivered right into the trough, which conveys the heavier impurities that are in suspension towards the scum plate, which, without this device, would sink to the bottom of the boiler and remain there. Thus the impurities of the water of whatever specific gravity, whether light, such as the salts of lime and magnesia, or heavy, as river and canal mud or sand, are, by the above means, collected and conveyed automatically to the separator C, which stands outside the boiler, usually on the flue covers; it is a cylindrical vessel of cast iron, fitted internally with scroll E, hanging downwards from the top, arranged to coil from the circumference to the centre of the vessel. The water flowing from the boiler enters the separator at A, and is caused to flow circuitously by the scroll, thus giving it ample time to deposit its impurities to the bottom, which is shaped to facilitate deposition. On reaching the centre of the scroll, the water returns to the boiler by the pipe B,



Bower's Patent Separator.



Bower's Patent Separator.

freed from its impurities,—a circulation is, by this means, set up from the boiler through the separator and back into the boiler again,—the impurities being left in the separator, from which they are blown out from time to time by the blow-off cock D. The circulation of the water is due to the natural laws of gravity, producing motion in two columns of water, the velocity of which depends on the difference of temperature existing between the current flowing out of the boiler and that returning to it again. This circulation once commenced will continue without intermission as long as steam is kept up in the boiler. An average amount of deposit removed from boilers by this patent apparatus is from 6 to 8 cwts. per month. Boilers requiring to be opened for cleaning purposes once every three weeks have been enabled to run without stoppage for three months after adopting the above system. Further particulars can be obtained from the Company, Messrs. G. W. Allen and Co., 63, York Chambers, 27, Brazennose Street, Manchester.

Odds and Ends.

A New York correspondent telegraphs:—The Boston commercial bulletin, containing the annual report of the United States wool market, has just been issued. For the year 1888 the supply amounted to 62,000,000 lbs., as compared with 110,000,000 lbs. in 1887.

* * * *

Very satisfactory results have been obtained in Paris from an automatic machine for silk reeling, owned by an American company, which does the work at a reduction of 10 to 12 francs per kilo on the expense of the present system of reeling from the cocoons. Colonel Ritchie, Mr. Forbes, and other well-known American residents in Paris, are concerned in this invention.

* * * * *

The king of the Belgians has conferred the rank of Officer of the Order of Leopold upon Mr. Lee Bapty, the British Commissioner-General of the Brussels Exhibition, and that of Chevalier upon Mr. Samson Fox, C.E., Managing Director of the Leeds Forge Co, member of the Exhibition Committee and Exhibitor, upon Mr. G. Hodgson, of Bradford, one of the principal exhibitors, and upon other Englishmen.

* * * * *

The Russian Government have recently introduced certain changes in their Customs tariff, some of which will probably affect the British trade. Half-wool plush, bearing printed designs, will henceforth be subject to an import duty of 1·10 roubles per pood, and ladies' mantles made of wool, and lined with caoutchouc, 2 roubles 40 copecs per lb All the duties have to be paid in gold.

* * * * *

A letter from the Belgian Consul-General at Cairo, published in the Belgian *Bulletin du Musee Commercial* states that a permanent exhibition of specimens of cotton has been organised at Minet-el-Bassel, the cotton centre of Lower Egypt. The Government have taken this exhibition under its protection, and it is hoped that it may prove very useful in promoting a healthy rivalry among growers by the award of honorary diplomas. In 1888 the cotton crop suffered by drought and the lack of the customary abundant flooding of the Nile.

As a great many British trading and manufacturing firms will either have offices or be otherwise represented in Paris during the coming year, it is as well, a correspondent writes, to call attention to a clause in the new law regulating trade in France. By this clause, any firm having already received medals at Exhibitions, or personal decorations, may only make use of them as embellishments on note paper, bill-heads, circulars, &c., if they at the same time give the date and name of Exhibition, &c., when they were given the medals, or decorations. Any infringement of this regulation entails a penalty of £120. As this regulation is a decidedly wholesome one for protecting the public, the commercial world cannot grumble if it is vigorously enforced next year.

German manufacturers have arrived at results which deserve to be noted. A carpet which cost, a few years ago, 60 thalers (£9), says, on this point, an organ of the trade, costs to-day scarcely as many marks (£3). It goes without saying that the tissue is not of as good a quality, that the delicacy of the colours, and the care devoted to the making, are, further, not the same, and that, finally, the sizes have been slightly diminished, but the first impression, especially of one who is not a connoisseur, is that it is quite as good an article as was formerly produced.

PATENTS.

Applications for Letters Patent.

Automatic stop-motion for looms, and means for producing a dwell during the shedding motion. J. Vickerman, Leeds. 4th Dec. 17,639

Adjusting trap levers of twisting frames. Messrs. Howson, Smith, Holden and Baldwin, Bradford. 4th Dec. 17,666

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13,907	15,780	15,796	15,894	15,896	16,012	16,091	16,094
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15,073	15,621	16,682	16,895	17,185	17,234	17,466	17,583
17,620	17,887	17,952	12,122	13,233			

Printed for the Publishers by JOHN DALE & CO., 17, *Bridge Street, Bradford, and Published by* HORATIO LORD *and* RICHARD THOMAS LORD, *at* 10, *Ann Place, Little Horton Lane, Bradford.*

The Journal of Fabrics AND Textile Industries.

Vol. 13. No. 90. FEBRUARY 12th, 1889. Price 10d.

Contents.

ILLUSTRATIONS.

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The Yearly Subscription—payable in advance—including home postage, is 10s. Cheques and Post Office-Orders to be made payable to H. & R. T. LORD, 10, Ann Place, Little Horton Lane, Bradford, Yorkshire.

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Woollen and Worsted Looms.

MOTIONS FOR TENSIONING THE WARP AND TAKING UP THE FABRIC.

BY METIER.

Some of the so-called minor details in power-loom mechanism are of the greatest moment in actual cloth production. There are so many contingencies to be provided for, in automatic weaving, that a really level cloth cannot be produced unless the minute and, apparently, trivial parts of the loom are accurately adjusted and uniform in action. In hand loom weaving, the weaver may tension the warp, set up the piece, and beat up the weft, exactly as he may consider necessary to obtain a perfectly constructed fabric. Should the warp, from some cause or other, slightly "give," or should there be any irregularity in the delivery of the threads, he readily detects and rectifies it. These motions being manually controlled, there is no difficulty in modifying them according to the density and stability of the fabric required. On experimenting with the power loom, the complication of parts makes rectification of defective movement considerably more perplexing to perform. To alter the tension of the warp, or to vary the pace of the setting up of the piece, or to modify the beating up of the weft, in an ordinary power loom, necessarily implies numerous mechanical changes. Of course, a practical loom tuner realises no difficulty in making the requisite alterations, but still, when all these movements are automatic, and immediately related to each other, unless conformity of action be maintained, the structure of the cloth produced will be imperfect. All these items indicate the importance of complete mechanical adaptation of parts, even in the secondary motions of the power loom. When weaving automatically, there should be one even tension on the warp threads from the commencement to the completion of the piece, that is to say, there must be not only a contrivance for delivering the warp at a uniform pace, but also for winding the woven texture on the cloth beam. If these were the only ends to be attained by these contrivances, the matter would be far simpler than it is. But there are other details in connection with the letting-off of the warp and setting-up of the weft that are, so far as helping in the production of a regular fabric goes, as important as these particulars. The warp, for example, must not be delivered in lengths, however short, but continually, and yet at as slow, or at as quick, a pace as necessary. Intermittent delivery of the chain would have a pernicious effect on the build and level appearance of the cloth. The threads would be slacker at some sheddings than at others, and would, as a consequence, when the weft was inserted and forced home, draw up on the surface of the cloth and form a "cockled" texture. Any letting-off mechanism that is not constructed on the continuous delivery principle is totally unsuited for looms intended for fine cloths, such as the better makes of woollen, composed of small yarns, and worsted coatings and trouserings. Let it be clearly understood what is implied in this description of letting-off motion. We do not mean that the warp is incessantly to be quitting the yarn beam all the time the loom is in motion, but that, for every revolution of the crank shaft, there shall be a certain length of warp given up, and a corresponding length of cloth wound on to the piece beam. Should the warp remain stationary for a number of picks and then be delivered, and be alternately stationary and given-off, the cloth would be faulty, as described above. Hence, one of the primary characteristics of a well designed delivering motion for the warp yarns is uniformity of action. At the same time as the warp is being unwound from the chain beam, the threads, throughout the weaving of the piece, must be maintained at an invariable tightness. The slightest alteration in this particular is at once seen in the irregularities of the cloth being woven. To understand this, let us suppose an instance of this kind—a fine worsted fabric, of a diagonal pattern, is being produced in a loom in which the yarns, while regularly delivered, are tight and slack alternately. In such sections of the piece, where the warp had been severely tensioned, the cloth would contain too large a number of picks, and be perceptibly denser and more compact than in those parts where the threads had been comparatively slack. In addition to this shadiness, due to irregular wefting, the uniformity and symmetry of the pattern would be entirely destroyed. Anon, the diagonal would traverse the piece at an angle of, perhaps, 30 degrees, and, anon, at 60 degrees, instead of being as level as possible from list to list of the cloth, each furrow in its structure being as rectilinear as if ruled with a straight edge. Of course, this is an extravagant instance, it, however, illustrates forcibly the effect on the fabric of lack of uniform tension on the warp yarns during the production of the texture, so that it may be concluded that a second essential of a good letting-off arrangement is exact and invariable controlling of the tightness of the warp. Providing that this motion is all that can be desired as regards these details, it should next be ascertained if it is so actuated that its movements will precisely correspond with those of the taking-up contrivance. It is obviously impossible to wind the woven cloth at a more rapid speed on the piece beam than the yarn is delivered off the warp beam, but it is feasible to have the warp passing, for some time, on to the healds more rapidly than the piece is taken up. Either of these conditions would damage the structure of the cloth in process of manufacture. If it were attempted to set up too rapidly, the yarns would gradually become tighter and tighter until the breaking strain was reached, when they would be fractured in groups at each intersection of the shuttle. On the other hand, not to take up the piece in the same ratio as the chain leaves the warp beam would result in the threads becoming, by degrees, so slack as to hang in the shed and make the weaving of a correct fabric impracticable. Evidently, therefore, to produce not only a sound but a uniformly dense and even texture, there must be absolute conformity of action between the letting off and the setting up mechanism. No loom should be regarded as adapted for weaving woollen and worsted goods if its motions for attaining the regular delivery of the chain, and the winding of the newly woven cloth on to the piece beam, are not constructed on the principles indicated. The best method of letting off applied to the modern loom is known as the positive motion. Every description of loom intended for particular work should be mounted with this mechanism. In weaving cotton textures and thin dress stuffs, the friction brake system of delivering and tensioning the warp (which merely consists of a stout rope wound several times round the chain beam and fastened to the loom frame, and of a lever which carries a heavy or light weight according to the tension applied), may answer satisfactorily, but, in the fancy worsted and woollen trades, there must be positive delivery combined with uniformity of tension. Not only can the warp be regularly given off on this method, but it can be varied in tightness as experience teaches to be desirable. This is accomplished by an ingenious contrivance. As the yarns are at their maximum tension when the shed is fully open, and, being tight before the shafts are actuated, they would be liable to break on the extra strain put upon them by shedding, were they not made to pass over a moveable rest which slightly approaches the shafts as the weft threads are being driven into position, thus relieving the tension and admitting of the piece being set up without any increased strain being applied to the warp. The distance travelled by this rest determines the tension of the chain during the beating-up of the picks. It is controlled by lever mechanism driven off the crank shaft, which again is weighted. If the weight applied is small, when the going part comes in contact with the cloth, it causes the rest to move considerably, and a corresponding length of fabric is wound over the cloth beam; but, should it be heavy, then setting up is not easily accomplished, and more weft enters the fabric, the picks being closely compressed, and the texture increasing in solidity and density. From this brief resumé of the main features in letting-off, and setting or taking-up contrivances, we learn that the beauty of the cloth, the soundness and uniform compactness of its structure, its level and even surface, are all dependent upon their correctness of adjustment and exact uniformity of movement.

New Patented Fabrics.

IMPROVED TERRY FABRICS.

In the manufacture of terry fabrics, of that kind in which one surface is composed wholly of loops, and the opposite surface of a design in loops upon a plainly woven back, the pattern has invariably been formed by the contrast between the looped surface and the plainly woven back ground. In the class known as double faced, that is, a fabric having an even looped surface upon both sides, the pattern is formed by loops varying in colour, the design appearing upon one side in loops of one colour, and the same design upon the opposite side in loops of a different colour. This invention is an improvement upon the former class of fabrics, in which an even terry surface is formed upon one side with a plainly woven under surface, relieved by designs formed by the terry loops. It consists of forming the even terry surface of warp threads of mingled colours, whereby a design may be formed in the even terry surface by simply drawing through to the opposite side alternate threads,

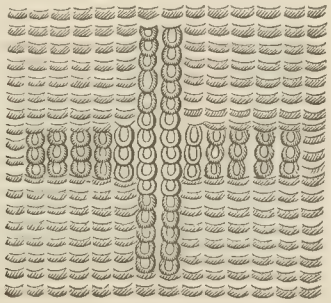


Fig. 1.

or of threads of one colour differing in colour from the remaining threads, thus leaving, against a back ground of mingled terry loops, a design composed of the remaining terry loops of one colour only and, upon the opposite side, the alternate loops which have been drawn through constitute a like design against a background of plainly woven fabric. It will be observed that the invention differs from the first known method, above referred to, by forming designs of the terry loops of one colour in the midst of a terry surface of loops of mingled colours; while it differs from the double faced fabrics, heretofore known, by reason of the fact that the design is not formed upon the terry surface by shifting or reversing the colours from one side to the other, but simply by shifting to the opposite side alternate loops of one colour, out of the mingled mass, which leaves upon the terry surface at this point loops of one of the remaining colours, thus forming the design which shows clearly against the loops of mingled colours which surround the design, while, upon the opposite face the design shows clearly in loops of the colour drawn through against the closely woven ground fabric. In the accompanying

Fig. 2.

drawings—Fig. 1 is a plan view of a portion of the fabric made according to this invention, the terry surface being here represented with the designs, or those places where alternate loops have been carried through to the opposite side, by loops a greater distance apart. Fig. 2 is a corresponding view of the opposite side. In carrying out the invention, warp threads of alternating colours are taken, for instance, one yellow and one white, and placed alongside each other, arranging them in number according to the width of the fabric to be formed. These warp threads constitute the loops or the terry surface, the operation of weaving being carried on in the ordinary and well known manner. This terry surface so formed, of the threads of different colours, produces a varied and novel effect in mass, and when it is desired to form designs upon the surface, by drawing through the white loops to the opposite side, the design of the yellow loops will show distinctly against the background of the mingled yellow and white loops, and when the yellow loops are drawn through, the white loops will show in the same manner, and thus designs of all characters may be represented upon the surface of the fabrics. On the opposite face, against the closely woven ground fabric, the loops drawn form a design in the opposite colour from that on the other face, the one design being formed of loops of a single colour in the midst of a mass of mingled colours, and on the opposite face by the loops of the other colour on a closely woven ground. In a design representing a vine, or a flower, or the like, the loops of both colours may be drawn through to the side, with the least amount of loops, to form the centre of the flowers of mingled loops, or to vary in this way other ornamental designs.

IMPROVED KIDDERMINSTER, SCOTCH, OR INGRAIN CARPETS.

An invention recently patented relates to the manufacture of Kidderminster, Scotch, or Ingrain carpets and fabrics composed of two or more plies; it has for its object the production, in the weaving operation, of dark and light shaded effects upon the ground or figure of such fabrics by suitable intermingling of the differently coloured warp and weft threads. This object is attained by so operating on the warps of the different plies as to bring over, or outside the weft of any colour, warps of different colours at the lines where the shaded effects are to be produced. According to the ordinary process of weaving multiple ply fabrics, such an object has not hitherto been attainable, as one half the warp threads in each ply—*i.e.*, the alternate threads of the ply—are simultaneously raised by the journals or leaves when throwing the shuttle with the weft of the same ply or colour and, even when journals or leaves are dispensed with, the same order of raising the warp is followed by having the jacquard cards cut with rows of holes to represent the journals or leaves. Under this invention, however, the use of leaves or journals is dispensed with, and, in lieu of cutting rows of holes in the jacquard cards to represent the leaves or journals, the cards are cut to bring as much of the warp of a colour over, or outside, the weft of the same colour or ply as is required to form the single, or self coloured, ground or figure, and so as to bring over or under them, at selected points, the warp of a colour or ply different from that of the weft shots, so as to cross the said weft shots and produce the appearance of a mixture of the colours of the differently coloured crossing warp and weft, or an effect of shading or gradation of colour. Such interchanging of warps of different colours may be carried out at any part of the ground or figure to produce a variation of the general pattern of the fabric, but it is particularly applicable for giving a variety of colouring to patterns which would, otherwise, be of single or self colours. The present invention may be employed in conjunction with the ordinary mode of weaving such fabrics. The journals or leaves of the loom are, in the latter case, represented by the cutting of the jacquard cards, the warps of different colours selected to cross or cover the weft shot being raised by cutting in the rows of holes corresponding to the ply or plies from which the selected warps are to be taken—the corresponding holes in the rows representing the journals being omitted. The following are examples of the effects which may be produced in weaving multiple ply fabrics. By using two distinct warps, *e.g.*, black (or any dark shade) as one ply of warp, and yellow (or any light shade) as the other, and by using the black or yellow warp to work with either the ground or figure wefts as desired, we obtain, at the points where an interchange of warps is effected, two distinct shades of colour from each weft colour used. By using dark brown for the ground weft, and light stone for the figure weft, chintzed in parts with red and green, either working the chintzed parts solid red and solid green, or shotting the red and green parts with stone coloured thread in rotation, (or shot-about) we obtain two shades of stone colour, two shades of red colour, two shades of green colour, or, if shotted in the chintzed parts, two shades of red and stone, and two shades of green and stone as desired, by using the dark or black warps for the dark shades, and the light or yellow warps for the light shades. The same effects may be obtained in greater variety by using extra wefts. By using two and a half plies, or three plies, of weft, whether with two or more plies of warp, the effects got are equal, or very similar, to those occurring in 4 or 5 frame Brussel carpets.

"COCOA" RUGS OR MATS.

Another patent relates to that class of rugs or mats known as "cocoa" mats, in which a centre portion, having tufts of coarse cocoa fibre, is combined with a patterned border of wool or other material finer than the centre, the object of the invention being to provide a border having a pattern of as elaborate a character as may be desired, without unduly increasing the cost of weaving the rug or mat. Ordinary rugs or mats of this character have a centre portion of coarse cocoa fibre formed into tufts confined to the threads of the warp, and a border of wool, or other finer thread, which is likewise tufted, the border being ordinarily made by the process known as "fingering," that is to say, strands of each colour required by the pattern being picked up from below the warp by the fingers at the proper points so as to be looped around the warp, and these loops being afterwards cut at the top so as to form tufts confined

by the warp threads. This, as will be evident, is a tedious process which precludes the use of any considerable number of colours in the border, or the formation of any but patterns of the simplest character. In order to overcome this objection, therefore, the border of the rug is made with a chenille weft, the threads of which are coloured to correspond with the desired pattern to be produced, this chenille thread being bound by fine warps which are tied down by weft threads shot across the shed from side to side, although the chenille wefts are only introduced in those portions of the shed which correspond with the borders of the rug or mat, that is to say, they extend completely across the shed at the opposite ends of the mat to form the end borders, but, between those portions are confined to a limited area at the outer edges of the warp corresponding in width to the width of the side borders of the mat. Two or more of these chenille wefts are introduced into each side border for every row of tufts of coarse cocoa fibre in the centre of the mat, the latter being bound by warps of a coarser character than those employed for binding the chenille threads of the border. The coarse warps, however, extend from edge to edge of the mat and, with the thick wefts, form the back of this mat, the spreading of the tufts of coarse fibre in the centre of the mat and of the chenille threads in the border being sufficient to cover and hide the thick weft and warp threads of the backing. The tufting of the cocoa threads in the centre portion of the mat is effected in the usual way by passing the bunch of strands alternately under a raised warp of the shed and over a slotted bar above the same, and afterwards cutting the loops by a knife passed through the slot of the bar. It is claimed that, by forming the border upon the mat in accordance with this invention, patterns of a very elaborate character, and having a great number of colours, can be produced with great facility, so that a mat of a much more acceptable character than those now made can be produced with but little, if any, increase in their cost.

"MOREEN" FABRICS.

This invention relates to improvements in "moreen" fabrics, or in that class of stiff watered fabrics commonly employed for making ladies' under-skirts and the like, and the object of the invention is to improve such fabrics by removing their dead or solid appearance. Hitherto, "moreen" fabrics have been woven from ordinary yarn, either dyed one colour in the top, in the yarn, or in the piece—this leaves them, when finished, one dead or solid colour, only relieved by the watering. The improvements consist in weaving "moreen" fabrics of mixed or mixture yarn, or of yarn in which the component fibres are of different colours or shades, thereby imparting to the finished fabrics a more or less variegated appearance. This variegated effect may be modified by using ordinary warp or weft in combination with mixed weft or warp.

SPINNING WOOLLEN YARNS.

A method of spinning woollen yarns, suitable for hosiery and other purposes, is accomplished by spinning two or more rovings together, the yarn resulting being composed of two or more strands according to the number of rovings employed. The doubling machine in the operation of spinning is dispensed with, the object being accomplished by the use of suitable guides attached to the spinning frame, the said guides forming the subject of a previous patent obtained in 1887. Advantageous results are claimed by employing the above method of spinning.

New Dyes and Colours for Dyeing, Printing, &c.

In a former issue, particulars of some new patented dyes and colours for use in dyeing and printing textile fabrics were given, and, as these seem to have interested a certain section of our readers, we purpose furnishing, at intervals, particulars of others that may come under our notice from time to time. An invention, having for its object the manufacture of colouring matters from the combination of certain diazo compounds with the active principles of certain woods, more especially of those contained in fustic (old-fustic yellow wood), young fustic and mahogany, has been patented recently. The diazo compounds, especially preferred for this purpose, are the chloride, sulphate, nitrate, or sulphonic acid of diazo-benzene or of diazo-toluene, of diazo naphthalene or of diazo xylene. The following is an illustration of the working of the process:—In the preparation of the colour, 1,000 lbs. of rasped fustic are stripped by successive boils with water, with or without the addition of alkali or acid, preferably with about 3 per cent. of sodium carbonate (soda crystals) divided in the first two liquors; if more be used, the colouring matter dyes a flatter shade. It generally requires four boils to strip the wood, and the successive liquors are mixed together, strained, passed through a cooling worm, and run into a large open vat. If the fustic has been stripped by water or acidified water, the liquor must be rendered slightly alkaline before the addition of the diazo compound. 38 lbs. of aniline are poured into an open tub containing about 1,000 lbs. water and 100 lbs, hydrochloric acid, and the whole stirred. A solution of 38 lbs. sodium nitrate is then run in with constant stirring to form the diazo-chloride. After standing a little while, this liquor is gradually run by means of a spigot, or other suitable apparatus, into the fustic liquor, which is now kept constantly stirred while the colouring matter forms. After the whole has been run in, a small quantity of sulphuric acid is added, when the whole of the colour is at once precipitated, and may be collected on a filter, and dried with the addition of a little alkali to make it soluble, or it may be used as a paste. To prepare the brown naphthaline colour, 50 lbs. of naphthylamine are dissolved by boiling in about 2,000 lbs. water, acidified with 160 lbs. of hydrochloric acid, then cooled, and the liquor made up to 4,000 lbs.; it is then diazotised with 40 lbs. sodium nitrate. The fustic liquor is then treated with this solution, as above described. In place of extracting the colouring matter from the fustic by successive boilings, the extraction can be accomplished on the methodical principle, in which the fresh boiling water is caused to act on the nearly exhausted wood, and then on less nearly exhausted material, till it leaves the series or apparatus, after acting on the hitherto untreated material; in such case, also, the material, as it gets more and more exhausted, meets with water less and less saturated with colour, till it is drawn out of the series through the newly applied fresh boiling water. In this case, the alkali is preferably added near the middle of the series.

Another invention relates to the production of green colouring matters, and consists in causing sulphur to act upon alpha nitronaphtalene. It has been found that if alpha nitronaphtalene be mixed with sulphur and heated to about 190° C (374° F), the sulphur begins to react upon the alpha nitronaphtalene, which reaction becomes more violent with the further increase of temperature. Sulphurdioxide is liberated and a melt is formed in which is found a green compound containing sulphur. This green compound is easily soluble in carbon bisulphide, and may be extracted from the crude melt by that or other solvent. The following is the best method with which to carry the invention into effect:—200 parts (by weight) of alpha nitronaphtalene are heated to about 210° C (410° F), to this 45 parts (by weight) of flowers of sulphur are added in small portions, whilst stirring so gradually that such temperature is maintained. The reaction between nitronaphtalene and sulphur gives off considerable heat, and the addition of sulphur has, therefore, to be managed judiciously. It is best to use as little exterior heat as possible, and to keep up the aforesaid temperature mainly by the heat of the reaction itself, and only a little by direct heating. The melt evolves sulphurdioxide and gets, eventually, so thick as not to allow of further proper stirring. The melt becomes hard and brittle on cooling, and has a spongy appearance, and when powdered it has an almost black colour. For obtaining the desired product (namely, the green compound or colouring material), the melt is finely powdered and treated with hot aethylic alcohol or hot methylated spirit until all matters which are soluble in this solvent are removed. The object of this treatment is to free the melt from nitronaphtalene and sulphur, not entered into reaction, and mainly to remove all those bye products which are soluble in alcohol. On treatment of the residue left after this treatment with hot carbon-bisulphide, a green solution is obtained which, on evaporation of the carbon-bisulphide, yields the main product in the form of a glossy looking dark molten mass. This treatment with carbon-bisulphide has likewise to be continued until all matters soluble in that solvent are obtained. The residue presents a dull looking and dark powder with hardly any characteristic properties. If the melt has been conducted as above stated, the treatment with hot aethylic alcohol or methylated spirit presents no difficuly, and, if the treatment with alcohol has been carried to the end as prescribed, the treatment with carbon-bisulphide yields a satisfactory product. Instead of treating the melt first with alcohol and then with carbon-bisulphide, it may be treated first with carbon-bisulphide, and then, the product so obtained, with alcohol. The extraction with carbon-bisulphide can easily be done in that way, but the treatment of the powdered crude main product with hot alcohol presents the difficulty that it often bakes together. Well conducted melts may, however, be advantageously treated in that manner if care be taken to extract in the beginning with cold, and only in the end with hot, alcohol. The green compound, or colouring material, is not a uniform chemical substance, but is a mixture of at least one green and one blue substance, the latter, however, only in small quantity. By treatment with hot Ligroine, these substances may be separated to a certain extent, and there will be obtained, as an extract, a substance of a more bluish shade and, as a residue, a substance of a less bluish shade, and, by admixture of these, other shades may be obtained if required. To render the green compound obtained soluble in alkali and suitable for dyeing and printing, it is sulphonated. For this purpose, the use of sulphuric acid containing 20 per cent. sulphurtrioxide is most advantageous. The operation is conducted as follows:— 1 part (by weight) of the green substance is dissolved in 5 parts (by weight) of sulphuric acid containing 20 per cent. sulphurtrioxide and is heated to, and maintained at, about 45 to 60° C (113° F to 140° F) until a test shews that the whole is soluble in alkali. It is then poured into five times its volume of water, and the sulpho-acid produced is filtered off. The crude sulpho-acid so obtained may be treated for purification by either of the methods well known to chemists. The compounds obtained in this manner by acting with sulphur upon alpha nitronaphtalene are called "Naphtylthiazine," and its sulpho acids "Naphtylthiazine-sulpho-acids."

New Zealand is to have an Exhibition this year. After much talk, and some delay, it has been decided to do without Government aid, and a company has been formed to carry out the project. The Exhibition is to be held in Dunedin.

Tariff Changes and Customs Regulations.

Russia.—Plush, or half wool, with stamped designs.—Section 202. Duty, 1 rouble 10 copecks per pound. Cotton collars, covered with celluloid, not sewn, but having the appearance of it—Section 219, point 1. Duty, 1 rouble 80 copecks per pound. Ladies' surtouts of woollen tissues, covered with india-rubber, not sewn.—Section 219, point 4. Duty, 2 roubles 40 copecks per pound. Cotton tissues cut up into designs, and ornamented with glass bugles.—Section 222, point 2. Duty, 45 copecks per pound. Ropes and cordage of cotton yarn, for use of factories and works, to be cleared under section 93, similarly as tallow wicks of untwisted yarn or thread. Duty, 4 roubles 80 copecks gold per pound. Coarse tissues (of several warps and woofs) manufactured of cotton, wool, and silk, and the outer surface of which is of pure silk originating from one of the warps or woofs, to be cleared under section 198, as half silk tissue. Duty, 2 roubles 90 copecks gold per pound Russian.

France.—Circular No. 1,947 states that borders or selvages of dyed threads on cotton and linen handkerchiefs, if exceeding in breadth 10 per cent. of the whole surface of the handkerchief, will be liable to the duty chargeable on "Tissue faconnés."

Spain.—Tissues of cotton, covered with wool on one side. —Category 143. Duty, 2 pesetas, 25 c. (9$\frac{1}{5}$d.) per kilog.

Servia.—Mr. F. R. St. John, Her Majesty's Minister at Belgrade, reports that consignments of British goods to Servia by way of the Danube are not treated under the most favoured nation clause, unless accompanied by a duly attested certificate of origin. By special arrangement with the Austro-Hungarian Government, goods from whatever country reaching Servia by way of Fiume or Trieste, are treated as Austro-Hungarian goods, and need not be accompanied by a certificate of origin.

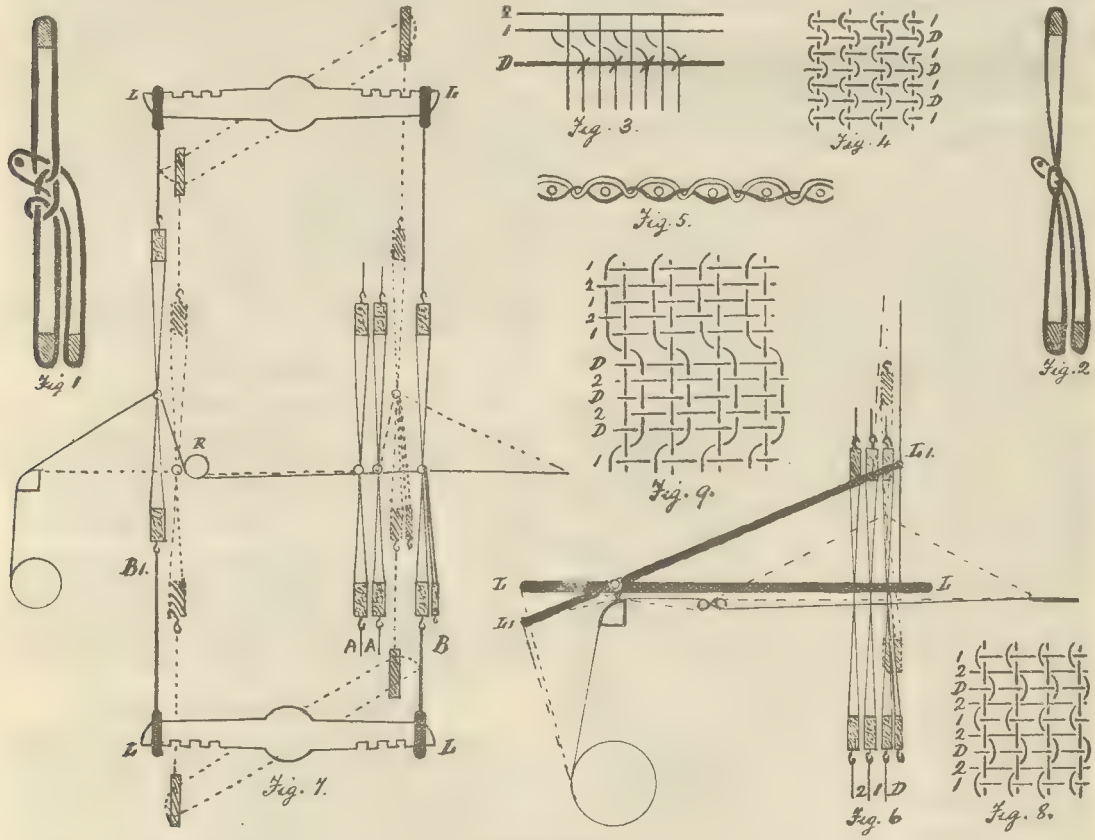
Transvaal Republic.—Machinery is reduced from 2$\frac{1}{2}$ to 1$\frac{1}{2}$ per cent. *ad valorem*.

Italy.—*Tissues and made-up clothes, embroidered.*—The denomination on the list "Tissues of every description, on which are attached, or sewn, patterns, flowers, trimmings, or drawings, also of the same material," which are charged the duty as "embroidered tissues, according to quality," has been erroneously interpreted by some Custom houses, which, owing to this reference, considered it unnecessary to ascertain whether the ornaments, &c., were made of a textile material subject to higher duty. Such an interpretation is not in accordance with the tariff, which establishes that "made-up clothes pay the rate of duty chargeable on the textile material, forming part thereof, which is subject to the highest duty. Therefore, notice is given that the tissues in question, and the relative made-up articles, are to be classified amongst the "Embroidered tissues, according to quality," only when the tissue, of which the trimming or drawing is made, is subject to a lower rate of duty than that of the material to which such trimming or drawing is attached, increased by the surtax for the embroidery. If, instead, the trimmings or designs are made of a tissue liable to a higher duty than that of the embroidered tissue, the tissues included in the above denomination of the Tariff Index List and the relative made-up articles shall be subject to the duty chargeable on the highest paying tissue, in accordance with the tariff. Thus a combed woollen dress weighing less than 200 grammes per square metre garnished with woollen trimmings sewn thereon, will have to be classed as "Woollen tissue, embroidered by '*punto passato*' (lock-stitch) in made-up articles," because woollen trimming is subject to a duty of 220 lire per quintal, which is inferior to that of 550 lire, chargeable on the tissue to which it is attached, embroidered. *Vice versa*, if on the same dress the trimming were of coloured silk, the dress itself should be classed as "Coloured silk trimming, plain, on made-up articles," because the coloured silk trimming is subject to a duty of 11 lire per kilogramme, which is higher than that of 5 l. 50 c. per kilogramme chargeable on the tissue to which it is attached, embroidered. With regard to "made-up articles" in establishing the classification of those articles composed of different tissues, of which one is embroidered, each tissue is to be considered separately, and the embroidery should only be taken into account for fixing the duty on the material on which it is placed. If it results that the tissue liable to a higher duty is one of those which are not embroidered, it is obvious that the embroidered tissue ceases from exercising any influence on the classification of the made-up articles, and the embroidery is no longer to be taken into account. Thus a made-up article of combed woollen tissues, weighing less than 200 grammes per square metre, embroidered *a punto passato*, and of coloured silk tissue, plain, not embroidered, shall be classed as "silk tissue, coloured, plain, not embroidered," because this latter tissue being liable to a duty of 8 lire per kilogramme, whilst that of embroidered wool is liable only to 5·50 lire per kilogramme, it constitutes the tissue on which a higher rate of duty is chargeable. *Ladies' Cloaks.*—In the class of ladies' cloaks admitted to the special treatment stipulated with Austria-Hungary, are to be also included the paletots, dolmans, dust-cloaks, Americans, polonaises, ulsters, and similar long overdresses, which, notwithstanding that they cannot be considered as regular cloaks, because these are sleeveless, still belong to that class of overdresses which are designated by position with the general denomination of cloaks. To avoid misinterpretations with regard to another clause of the said treaty invoked for the classification of cloaks with trimmings, ornaments, and designs, the following explanations are given:—The treaty establishes that, in fixing the duty on ladies' cloaks, no notice should be taken of the material forming part thereof, liable to a higher duty if it be in a proportion less than a tenth part of its surface. This does not imply that, in charging the duty on the tissue of which the cloak is made, one should not take into account the effect as to duty, which is caused by the fact that a tissue charged at a higher rate is attached to it. The treaty as regards men's and boy's clothes and ladies' cloaks of wool, stipulates:—(1.) The exclusion of the material liable to a higher duty when it forms part of the said articles in a proportion of less than a tenth of their surface. (2.) The surtax for made-up articles should be of 40 per cent. instead of 50 per cent. as established in the general tariff. But as regards the classification of the materials of which men's and boys' clothes and ladies' cloaks are made, no disposition of the treaty compels a different view to be taken from what is established in the general tariff; therefore, the surtax deriving from the embroidery should not and is not to be overlooked. The tariff index mentions "tissues of every kind to which are attached, or sewn, ornaments, flowers, trimmings, or designs also of the same material." Therefore, ladies' cloaks garnished with trimmings or designs sewn thereon, if, owing to the treaty, they escape the duty of the material liable to a higher rate, forming part thereof in a proportion of less than one tenth of their surface, cannot escape duty as "embroidered tissues." *Painted iron articles*—Iron articles painted over with the paint not strongly adherent, intended solely for preservation during the journey, not to be considered as varnished. If, however, the said articles have been painted over with a strongly adhering paint intended as a first coating for subsequent varnishing, they are to be considered as varnished. *Detached parts of machinery.*—Single pieces or detached parts of machinery are frequently presented for clearance which, with other parts to be sent from abroad by subsequent consignments, are intended to make up complete machines. In these cases, the department authorises the Customs officials to suspend the classification of such goods till the other supplementary pieces, intended to complete the machines, are produced for clearance as a last consignment. This facility is granted, however, on condition that the importer at the time of presenting the declaration relative to the parts of machinery received by the first consignment should deposit at the Custom house the designs of the machines, showing the single parts to be received by each consignment, and that he should deposit the duty of 11 lire the quintal as chargeable on "detached parts of machines." The Custom houses are authorised to let such parts of machinery pass by issuing bonds to be thereafter exchanged for a final bill of payment, when, with the last consignment, the machines shall have been completed. It is obvious that, in case of controvesy as to the use of the machines, the question is to be raised after the arrival of the last consignment, and before the final bill of payment is issued. Collars, cuffs, and gentlemen's shirts made of linen are subject to double the duty of the tissue, as per general tariff, inasmuch as No. 946, "Sewn articles in collars, cuffs, and gentlemen's shirts," is not included in the treaty with Austria-Hungary. Tissues and made-up articles have each a separate denomination in the tariff, and the special treatment affecting some qualities of linen is not to be extended to sewn articles in collars, cuffs, and gentlemen's shirts.—*Board of Trade Journal.*

Gauze Weaving.

The question is often asked, "What is gauze, and how is it produced?" One authority describes it:—"A thin transparent fabric of silk or linen, receiving its name from Gaza, in Palestine, because believed to have been first made there." Another authority says:—"Gauze fabrics have not their warp threads lying parallel to each other as in plain or figured fabrics, but they partly twist round each other to form the desired pattern; the weft threads may be parallel to each other, or their parallelism may be disturbed by the crossing of the warp threads." This peculiar crossing of the warp threads in gauze is produced by means of a doup, which consists of an ordinary heald with half an heald attached to it, as shown in Fig. 1, where we have an ordinary heald of the loop kind, and an extra half heald or "slip" passing through the noose of the heald and back through the top loop. Another form of doup is shown in Fig. 2, where the heald has a large mail of the ordinary kind, and the slip is passed bodily through it. Fig. 3 shows the method of drawing the warp threads through the healds. Here we have shown two ordinary healds besides the doup, the warp threads being drawn through the two healds as in perfectly plain weaving, then the threads that pass through the first heald are passed under those of the second heald and through the doup, as indicated. It must not be supposed that the threads are put through the noose or mail of the doup, they are put through the slip only, as indicated, by means of the dots in Figs. 1 and 2. Fig. 4 is a plan of perfectly plain gauze, where a crossing takes place between every thread of weft. No. 1 heald is raised for the first pick, and, as will be seen by referring to the draft, Fig. 3, raises the crossing thread on the left side of the thread drawn through No. 2 heald; the doup is raised for the second pick and lifts the same thread as before, but on the right side of No. 2. When No. 1 heald is raised, the loose half or slip must be raised with it, otherwise, the slip would prevent the thread going up. When the doup is raised, the slip is carried with it in the case of Fig. 1, but where a doup, similar to Fig. 2 is used, the slip must be raised by other means, as they are not attached to each other.

This is generally done by fastening a cord to the shaft of the slip, and connecting it to the levers which raise No. 1 and doup respectively, so that, when either of them is lifted, the loose half is lifted also. Fig. 5 is a section of plain gauze, where the weft threads are shown by small circles, and the warp threads passed through No. 2 heald by a thick line; as will be seen, the thread passed through No. 2 is never raised, while the crossing thread is always on the top, the cloth being held together by the crossing which takes place between the picks. The crossing thread which is shown by means of a double line, comes down on one side of No. 2, and passes back again on the contrary side, as shown in the draft, Fig. 3, and is accomplished by raising No. 1 and doup alternately. In gauze weaving, besides having this peculiar arrangement of healds to enable the threads to partly cross round each other, we must also have some means of slackening, or easing, the crossing thread when the doup is lifted. As will be readily seen on referring to the arrangement of the doup in Fig. 1, when No. 1 heald is lifted, the slip is also lifted, allowing the threads to form a natural shed; but when No. 1 heald is stationary and the doup is lifted, we must have some means of allowing the crossing threads to come in, otherwise, no shed could be formed, as the warp would be held down by No. 1. This is accomplished in a simple slackening heald connected with it by means of levers LL. As will be seen, when the doup is at rest, the slackening heald is as much above the warp line as the doup will rise; when the doup is raised, the slackening heald is depressed, as shown by means of the dotted healds and levers. R is a rod fixed in brackets, and passed from one side of the loom to the other, so arranged as to move further or nearer to the slackening heald, so as to give off more or less warp, as occasion requires. Too much attention cannot be given to the setting of the doups and the arrangement of slackeners in the loom, as it is generally this want of attention to these particulars which creates so much trouble in gauze weaving. If the warp is slackened too much, the slip will be drawn through the doup and get entangled with the warp threads, causing what is known as "knuckling." If it is not slackened sufficiently, the warp threads will be too tight, and the shed will be only partly formed, either of the two causing great inconvenience and wear of the doup. The sheds should be so timed that the crossing thread should be perfectly at rest, after No. 1 has been raised, before the doup is allowed to rise, otherwise, the slip would be pulled quickly round, causing either breakage or entanglement of the threads. The doup might be set a little lower than No. 1, so as to effect the crossing better. If the shedding is carefully attended to, the slackening



Gauze Weaving.

form by means of a lever, as shown in Fig. 6, which is fixed to the back beam of the loom. The threads which are drawn through No. 1 heald are passed over the back beam in the ordinary manner, as shown by the solid line; the threads which pass through the doup are also passed over the lever, as indicated by the dotted line. When the lever is stationary, as shown by L and L, all the threads are at the same tension, and No. 1 would lift in the ordinary manner without in any way affecting the lever. When the doup is lifted, the lever is also lifted, and lets off as much warp as the doup takes up; when the doup descends, the lever falls again into its former position, drawing all the threads tight previous to the weft being beaten up to the cloth. Fig. 7 is another method of slackening the warp threads, patented by Messrs. Ashenhurst and Lishman; in this case, the slackening is done by means of healds instead of rods, and is applicable to two or more doups, where each doup has its own slackener. A,A are the ordinary healds. B is the doup and B,1 the will soon regulate itself according to the length of warp necessary for the distance traversed by the doup. Fig. 8 is what is known in the Bradford district as a leno, being simply a pick of gauze and plain alternately. It is produced by the same draft as plain gauze, the crossing taking place under the picks, instead of between them. In this case, No. 2 is raised between the gauze picks, allowing a greater amount of material to be put into the cloth than is capable by perfectly plain gauze. The term leno, as understood in some districts, is any combination of gauze and plain in any form Fig. 9 is a combination of plain cloth and half gauze, that is, the thread crosses from one side to the other and remains there, after the manner of Balzerines. To produce this, the first series of plain picks are woven with Nos. 1 and 2, and the second series with doup and 2, the same draft and douping arrangements being used as in Figs. 4 and 8. In a future issue, we shall show one or two methods of slackening, or easing, the warp, adopted in jacquards for gauze weaving.

Original Designs.

Our first plate contains a design for a three-quarter, five frame, Brussels Carpet. It would look well with either light or dark ground according to treatment—for instance—straw or cream ground, with ornament in tan, olive, and sage, with maroon outline, or, with dark ground, and the maroon and cream reversed. Mr. J. W. Brook, Ashton Clough, Liversedge, has designed this pattern.

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Our second plate shows a design for a Cretonne, which is also suitable for other purposes. This has been drawn by Mr. F. Layton, York Terrace, Akroydon, Halifax.

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On our third plate, we give a pattern for a Toilet Cover, designed by Mr. R T. Lord, 10, Ann Place, Bradford.

Monthly Trade Reports.

WOOL.—The consumption of wool during the month has been fairly good, and prices have been firm. At the London sales, biddings have been brisk, and may be quoted at an average of last sales. With some slight exception, the demand for yarns has been fairly satisfactory, both as regards orders and prices, although the latter are not so good as could be wished. Merchants, generally, are doing their utmost to bring prices down, but with little success, as, in the face of firm wool markets, spinners prefer working out old orders to taking new ones at lower rates The machinery on piece goods keeps fairly well employed on a variety of specialities, the aggregate production each week being very large. The Continental demand has been quiet and, judging by appearances, seems likely to be so for some time. The demand for America has fallen off somewhat, and home orders have come in rather slower, still there are hopes of an improved state of things shortly.

COTTON.—There has been about an average sale of the raw material; prices have fluctuated slightly, and have had a rather higher tendency. This has caused purchasers to buy for actual requirements only. The demand for yarns, both for home and abroad, has been mostly for immediate consumption, there having been an absence of speculation. Spinners have generally asked higher rates, and manufacturers, in consequence, have been very tardy in buying more than they have actually required. The tone of the cloth branches has been rather quieter, business having been under the average. The demand for the East has fallen off, and, when business has been done, low prices have had to be taken. The sales to other foreign countries have been steady, but for the home trade the reverse has been the case.

WOOLLEN.—This branch of industry keeps very satisfactory. The volume of trade doing is large and constantly increasing in some branches, the prospects for the future being very hopeful. For next winter's trade, orders are being now booked, and, although not in large numbers, they are such as to put manufacturers in a cheerful state of mind as regards work for the next few months. In worsteds, the demand for America has much improved recently, it being the wish of exporters to that country to have a large stock of goods there before the revision of the tariffs, which seems to threaten the sales to the United States. The tweed and cheviot branches have met with much encouragement, and the advances made in respect to design, &c., of these cloths, are meeting with appreciation at home and abroad. In cloths for the clothing trade, the demand is fairly good, and prices generally are firm, with a higher tendency.

LACE.—The curtain branch of this industry has improved during the month as regards the increased number of orders, although, as in other branches, there is the usual outcry of unremunerative prices. Novelties in laces are rather scarce, the goods made being mostly variations of old styles. The demand for nets, ruching, frillings, and other such goods, has improved slightly, and, on the whole, a better feeling pervades the various departments of the trade, and hopes are entertained of an increased demand as the season advances. In silk goods, the sales have only been small, and business generally quiet.

LINEN.—There is not much new to note in this industry. A fair business has been done in goods for domestic use, where fancy designs have been effective. In drills and drabbets also, a moderate number of orders has been given out, and trade generally has been about an average. Damasks have fallen off in demand. There is still much machinery unemployed, as has been the case for some time past. The demand for America and abroad, generally, has not improved. Prices have shown little difference from the preceding three months.

Bleaching Wool by Peroxide of Iron.

M. P. Ebell, in the *Chemiker-Zeitung*, has an account of some experiments made upon bleaching wool by the agency of peroxide of hydrogen. Delmart had previously reported upon a number of trials with this material, but, according to the same experimenter, many of his instructions require serious rectification. It is clear that both series of trials were on a small scale, nor is there any clear knowledge that the peroxide has been anywhere applied on a commercial scale. Some of Ebell's corrections upon Delmart may be noted. The purer the peroxide of hydrogen, the better it is; there is no chemically pure peroxide in the market, unless it be what is specially purified for medical purposes. It is not correct to say that the peroxide must be used cold. The best temperature at which to work differs with the quality and concentration of the peroxide; the weaker the solution of peroxide, the warmer it may be worked; a strongly alkaline bath must be worked cold. It is an error to direct the use of weak solutions of the peroxide; the commercial article, at 3 per cent. is suitable in all cases, and to be preferred. The wool must be kept in constant movement. Drying in the open air is hardly practicable on a large scale, it is sufficient to hang the goods up in a well-ventilated, cool room. The author considers he has demonstrated as true that goods dipped in a 3 per cent. solution of peroxide of hydrogen, and hung up to dry at a natural temperature lose water first, and the peroxide becomes more concentrated as the water evaporates, so that, towards the end, it may reach a condition of 20 per cent. strength, or upwards, without suffering decomposition; at such a strength it must act more vigorously than at 3 per cent. It follows that, as a general rule, it is not necessary to wait for the perfect bleaching of the woollen goods in the 3 per cent. solution, but, when well impregnated with it, to take them out and let them dry in a room at ordinary temperature, and repeat these operations until the bleaching is perfect. What takes place in the way of chemical action in the employ of peroxide of hydrogen is very probably a direct oxidation, for the percentage of oxygen in the liquid continues to diminish though no visible gas is liberated. The nature of the colouring matter existing in unbleached wool is quite unknown, but it would appear that its oxidised product is of an acid nature, for the alkalinity of the bath is continually reduced by the neutralisation of the ammonia. Peroxide of hydrogen made alkaline by ammonia is fairly stable, not changing much in strength by long keeping. The attempts made by the writer to estimate the cost of the bleaching could not possibly give any reliable results from the small scale of his experiments.

Post Office Notices.

EXTENSION OF THE PARCEL POST.

Canada.—Parcels not exceeding 4 lbs. in weight may now be transmitted to *any* post office in Canada. The rates of postage are:—For each pound or fraction of a pound—To New Brunswick, Nova Scotia, Prince Edward Island, and the Province of Quebec, 1s. 3d.; to the Province of Ontario, 1s. 5½d.; to the Province of Manitoba and the North-West Territories, 1s. 8d.; to British Columbia and Vancouver Island, 1s. 10½d. Greatest length allowed is 2 ft., greatest breadth or depth, 1 ft.

India, Aden, and Zanzibar.—The postage on parcels not exceeding 11 lbs. in weight for India (including Burmah and the Indian post offices in the Persian Gulf), Aden, and Zanzibar, is for not more than 1 lb., 1s.; for each pound or fraction of a pound additional, 8d. Parcels for India, Aden, and Zanzibar are despatched from London every Wednesday morning. No parcel must be more than 3 ft. 6 in. in length or 6 ft. in length and girth combined, and must not exceed £50 in value.

Industrial Exhibition at York.

It has been decided to hold a fine art, ecclesiastical, educational, and industrial Exhibition in York in the buildings and grounds of the Fine Art and Industrial Institution, from June to October, 1889. It is intended that the Exhibition shall be of a superior character, especially in respect to the quality of the exhibits, and every effort will be made on the part of the management to exclude such articles as are not strictly appropriate to the objects, or which might tend to lower the tone, of the Exhibition. Diplomas of honour, diplomas for gold and silver medals, and diplomas, will be awarded by competent jurors or experts to such exhibitors in each department or section as may be deemed entitled thereto. The jurors or experts will be empowered to award medals, in addition to the diplomas, should they deem the exhibit of sufficient merit. Arrangements have been made with the Committee of the County Hospital (founded 1740) and the Directors of the City Dispensary (founded 1788) in York that a part of the cash receipts for admission shall be handed to the above charities, thus ensuring to each Institution a positive benefit from the opening until the close of the Exhibition. The exhibits will consist of the following sections:—Fine arts, ecclesiastical, scientific and chemical, educational, decorative, industrial, &c. To manufacturers and designers of figured fabrics, &c., the Exhibition will be worthy of a visit, as it will contain, no doubt, admirable collections of fabrics of various descriptions, including carpets, linens, velvets, tapestry hangings, laces, &c.

DESIGNED BY J. W. BROOK

BRUSSELS CARPET.

CRETONNE.

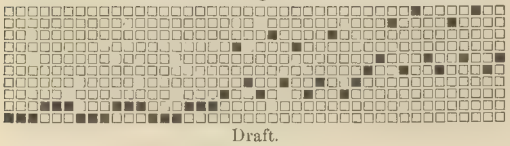
TOILET COVER.

FASHIONABLE DESIGNS.

Worsted Trousering.

No. 565.

Design.



Draft.

Pegging Plan.

3,948 ends in warp; 43 ends per inch in cotton cords; 87 ends per inch in stripe; woven in a 14¼ reed; cotton, 3 ends in a reed; stripe, 6 ends in a reed; 80 picks per inch; 64 inches wide in the loom; 56 inches wide whe finished. Weight 20¼ ozs.

Warp :—18 ends cotton, Black, 5's, 3 in a reed.

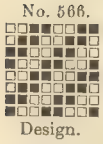
6 ends in a reed:

1 end	worsted,	,,	2/40's,
1 ,,	,,	Red,	,,
1 ,,	,,	Black,	,,
1 ,,	,,	Twist,	,,
1 ,,	cotton,	Black,	5's,
1 ,,	worsted,	,,	2/60's,
1 ,,	,,	Blue	2/40's,
1 ,,	,,	Black,	,,
1 ,,	,,	,,	2/60's,
1 ,,	cotton,	,,	5's,
1 ,,	worsted,	Twist,	2/40's,
1 ,,	,,	Black,	,,
1 ,,	,,	,,	2/60's,
1 ,,	,,	Twist,	2/40's,
1 ,,	,,	Blue,	,,
1 ,,	,,	Black,	,,
1 ,,	cotton,	,,	5's,
1 ,,	worsted,	,,	2/60's,
1 ,,	,,	,,	2/40's,
1 ,,	,,	Red,	,,
1 ,,	,,	Twist,	,,
1 ,,	,,	Black,	,,
1 ,,	cotton,	,,	5's,
1 ,,	worsted,	,,	2/20's,

Weft :—2/28's all Black.

Trousering or Mantle Cloth.

No. 566.



Design.

13 ends 2/13's Bluish Grey worsted.
3 ,, 4's, made from 2/11's Old Gold worsted, twisted with 1/20's red worsted.

16 ends in pattern.

Weft :—2/15's worsted, all Grey.

1,920 ends in warp; 30 ends per inch; 30 picks per inch; 7½ reed, 4 ends in a reed; 64 inches wide in the loom; 56 inches wide when finished. 16¼ ozs. per yard.

Woollen Costume Cloth.

No 567.

Design.

Warp :—1 end Grey, 25 skeins } 5 times.
1 ,, Brown, ,,
1 ,, Grey, ,,
2 ends Red ,,

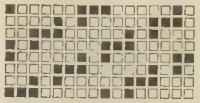
13 ends in pattern.

Weft :—28 skeins, all Grey.

1,798 ends in warp; 29 ends per inch; 28 picks per inch; 7½ reed, 4 ends in a reed; 62 inches wide in the loom; 56 inches wide when finished. Weight 8 ozs.

Suiting or Mantle Cloth.

No. 568.



9,728 ends in warp; 152 ends per inch; 72 picks per inch; 19's reed, 8 ends in a reed; 64 inches wide in the loom; 56 inches wide when finished. 13 ozs. per yard.

Design.

Warp :—2 ends	Brown,	2/60's worsted	} 16 times.
2 ,,	White,	,,	
2 ,,	Yellow,	,,	
2 ,,	White,	,,	} Twice.
2 ,,	Brown,	,,	
2 ,,	White,	,,	
2 ,,	Brown,	,,	
2 ,,	White,	,,	
2 ,,	Yellow,	,,	
2 ,,	White,	,,	} 16 times.
2 ,,	Brown,	,,	
2 ,,	White,	,,	
4 ,,	Brown,	,,	} 10 times.
4 ,,	White,	,,	

236 ends in pattern

Weft :—1 pick White, 2/60's worsted.
1 ,, Black, ,,

A Test for Adulterated Olive Oil.

In France, where the consumption of olive oil is somewhat general, and where the expanse of territory of suitable character, with attendant warm climate, is limited to grow the olive, considerable consternation has been caused amongst consumers by the wholesale adulteration to which olive oil is now subject. Cotton oil is the principal ingredient used for this purpose, but oils of sesame, cameline, peanut, and poppy seed have also been utilised. Up to within a recent period, beyond elaborate laboratory tests, there did not exist a simple process for ascertaining whether, and to what degree, olive oil was mixed with these adulterants. M. Brullé has, however, devised a plan by which, it is stated, any adulterants may easily be discovered. The process consists in placing one grain and a half of albumen (heated to expel moisture) with three cubic centimetres of citric acid, and ten cubic centimetres of the oil, to be tested in a test tube, which should then be corked (leaving a vent-hole) and shaken. The tube should be warmed first, at the point where the hole is, in a spirit lamp, and then in the neighbourhood of the acid. A violent ebulition will ensue, and, when this is general in the mixture, the tube should be plunged into cold water about 40° Fah. An oleaginous precipitate will be produced by the cooling, and this supplies the evidence of purity or adulteration. If the oil is pure, the precipitate will be of a pale yellow character, and if not, then a darker shade will be shown, getting darker as the adulteration is the more excessive.

Book Notice.

TEXTILE MANUFACTURERS' BOOK-KEEPING: BY G. P. NORTON, A.C.A.

Huddersfield :—A. JUBB.

This work is a treatise specially designed for the woollen, worsted, and allied trades, and is in every sense of a thoroughly practical character. Although rather a voluminous looking publication, it is none too large for the detailed matter it contains, and which is given in a clear, concise, and comprehensive, manner. Words of ours cannot express what is due to the author for the admirable way in which he has put before manufacturers generally a true system of book-keeping, which ought to ensure to them thorough accuracy in their accounts. The work commences with the elementary principles of book-keeping, and various detailed examples are given, which may be easily comprehended. Then examples are given of the various books required and forms of entry, from the day book to the making of a balance sheet, and specimens of work, comprising all classes of transactions connected with the textile manufacture. There is also an appendix, giving a fund of practical information relating to bills, notes, cheques, letters of credit, and also to various law matters. The work, which is published at 21s., ought to be in the hand of every manufacturer.

The *Journal de la Chambre de Commerce de Constantinople* states that the Government of Aidin has recently enjoined the makers of carpets, known as "Smyrna," to use in their works vegetables dyes, as has been formerly done, and not aniline colours. Offenders against these regulations will be severely punished.

MACHINERY, &c.

Revolving Flat Carding Engine with Wilkinson's Patent Adjustable Revolving Wheel or Disc.

During the last few years, a very large amount of attention and expense have been bestowed upon the revolving flat carding engine. One improvement after another has been introduced, until it is now looked upon as the carding engine of the future. Its success, however, does not blind cotton spinners to the fact that it has its defects, and any invention for the removal thereof naturally is of some interest to them. It is claimed that the carding engine about to be described contains several important and most valuable improvements over others upon the revolving flat principle, and such improvements as cotton spinners will not be slow to recognise and take advantage of. In all other revolving flat carding engines now at work, the working flats pass over a stationary course or surface, usually termed the bend. As the weight of a single flat when clothed may be taken as 6½ lbs., it will be seen that the total weight of the flats (say 42) working at a time is 273 lbs., this weight being constantly dragged in one direction over the stationary flat course. This, of necessity, engenders a large amount of friction, which, in course of time, causes considerable wear to take place, not only to the bends themselves, but also to the flat ends. It is well known to machinists and others, that, from a variety of causes, it is an impossibility to make the metal of a complete set of flats one degree of hardness, hence the wearing of some of the flat ends before others, as is always found to be the case, the softer ones necessarily wearing first. The bends, also, from a variation in their hardness or temper, and from unequal pressure in different parts of the circle, wear unequally, and they ultimately come to present an irregular and wavy appearance. Carders have experienced great inconvenience, and millowners have suffered considerable loss, from the above causes, the quality of the work being thereby depreciated, and the carding power of the engine reduced. If the maximum of work, and that of the first quality, is to be obtained from a carding engine, it is essential that the arc described by the working flats should be in perfect unison and concentricity to the cylinder, and that means should be provided for maintaining this perfect concentricity so long as the carding engine itself will work. In other flat carding engines, it has been found that, after a few years' working, some of the flats have worn more than others, even to the extent of $\frac{1}{32}$ of an inch; but if only half a dozen flats have worn, say, $\frac{1}{64}$ in., the remaining 100 flats must be "set-off" $\frac{1}{64}$ in. further from the wire on the cylinder to accommodate the 6, the production of the carding engine being thereby seriously diminished if satisfactory work is to be obtained. In some cases, the re-cutting of the flat ends is resorted to, but it is evident that, for a long time before this course is adopted, the carding must have been materially depreciated in quality, and the same liability to wear again still exists after the re-cutting. The only way to overcome these objectionable features is to make it impossible for them to exist, and it is claimed that this is the case in the revolving flat carding engine now about to be described. In general dimensions, &c., it is similar to other carding engines. The most important patent in connection with it is the adjustable revolving wheel or disc. In order to more clearly show the construction and improvements introduced, a cross section and a part side elevation are given in Figs. 1 and 2. A is a pedestal bolted to the carding engine framing B. There is an adjustable bush C carrying a revolving disc D, and the working flats F are shown supported upon the rim E of the disc D, there being, of course, a disc on each side of the cylinder. The special feature of the machine is that, instead of the flat ends passing over a stationary bearing surface, they rest upon the rims of the disc wheels which are 1 in. wide, and the weight of the working flats, without the aid of any gearing, carries the discs round, both travelling at the same surface speed. There is, therefore, an absence of friction, and, consequently, no wear of the flat ends, or of their revolving course, can take place. To prove that this is the case, it is only necessary to place a chalk mark on one of the flat ends and the periphery of the revolving disc wheel, where the flats commence to work, and it will be seen that both travel at the same speed, the two marks remaining together until the flat leaves the cylinder. The discs are bored in the centre (and are mounted upon adjustable bosses, 9 ins., diameter, one on each side the machine, fixed perfectly true with the shaft), and from this centre are turned on the edges to a perfect circle, so as to revolve in exact concentricity to the cylinder, and, as all the working flats rest upon the disc wheels, the difficulty usually experienced in setting the bends and, consequently, the flats, is entirely obviated, and as the wire of each of the working flats is exactly one and the same distance from the wire of the cylinder, there is the most regular and perfect carding of the cotton ensured. Another most important feature is that exactly the same accuracy and regularity can be maintained as long as the carding engine will work as, when the wire of the cylinder has been ground, it is only necessary to reduce the diameter of the discs (in the manner described later on), and the flats resting upon the latter naturally follow the reduced radius, and are thus brought to the correct position. This is accomplished in the simplest manner without removing the flats and without any loss of time, as the operation is begun

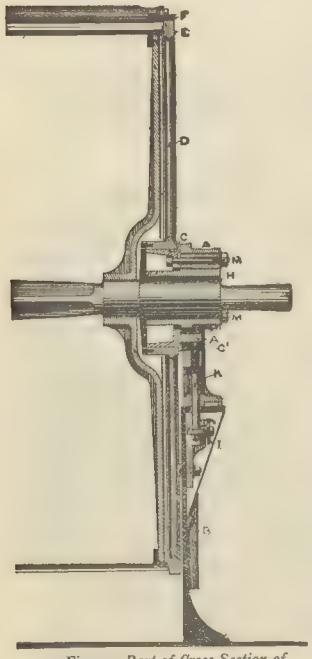


Fig. 1.—Part of Cross Section of Carding Engine.

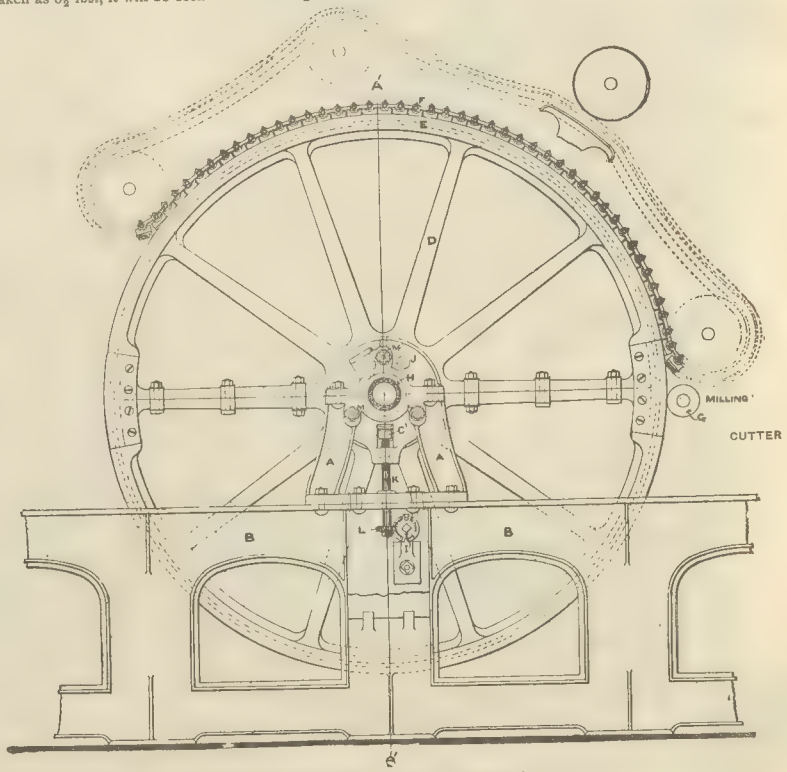


Fig. 2.—Part Side Elevation of Carding Engine.

and completed whilst the engine is carding. The cylinder ends are sunk in, which has been done to admit of the following parts:—Disc D is bored out and revolves upon a bush C, 9 ins. diameter. The hole in this bush, being larger in diameter than the boss which covers the bearing for the cylinder shaft, allows space for adjustment, permitting the bush and the disc to be moved in a vertical direction to facilitate the setting of the flats. By means of slots cut in the bush, and the 3 bolts M passing through the pedestal A and the bush itself, the latter is secured in any position desired. It can be ascertained with perfect certainty, by the steel zero test pin or stud J, whether the disc and cylinder are in exact concentricity, as, if there is only $\frac{1}{1000}$ part of an inch variation between the two, it is impossible to insert this pin. The pedestal supporting the cylinder shaft is a fixture on the card side and not moveable (as is the case in some other carding engines), the flat course being adjustable to the cylinder, and not the cylinder to the flat course. Another decided improvement is the patent revolving bush, shown in Figs. 1 and 2. The cylinder shaft passes through the bearing or bush H; this bush engages itself with the revolving disc D, and, as the latter makes about one revolution per hour, the bush H is always moving slowly round, so that the cylinder shaft is gradually, but constantly, having presented to it a fresh bearing surface, which at once equalises and minimises the wearing of the shaft and bearings. The next improvement we will notice is the setting arrangement for the flats. When the wires of the cylinder and flats have been ground, there is, of course, too much space left between them, and it is necessary not only to bring the working flats nearer to the cylinder, but that means should be provided for ascertaining the required distance with certainty. The rims of the revolving discs E are, therefore, reduced by means of milling cutters G, shown in Fig. 2, one being placed against each disc at the back of the carding engine, and, consequently, the flats resting upon the discs can be lowered to the required distance. The setting operation of the flats is effected by a micrometer arrangement in the following manner:—Inside the pedestal A is an upright screw K, on the top of which rests a lug C¹, cast to the adjustable bush C, and upon this bush, the boss of the revolving disc, which carries the flats, works. This upright screw is cut to pitch 25, *i.e.*, there are 25 threads to the inch, thus it would require one complete turn of this screw to lower the bush (and, consequently, the disc and flats) $\frac{1}{25}$th part of an inch. If it is required to lower the disc and flats $\frac{1}{1000}$th part of an inch, it will be seen that to accomplish this it is only necessary to turn this screw $\frac{1}{40}$th of a revolution to the left, and which is gauged as follows:—At the bottom of the upright screw is fixed a worm wheel L, containing 20 teeth, which gears into a small single worm fixed at the end of the dial stud I, so that, if the dial and worm are turned half a revolution, the 20 teeth wheel will have been turned half a tooth, or the required $\frac{1}{40}$th of a revolution, which, as explained above, lowers the bush (with disc and flats), resting upon the top of the upright screw K, $\frac{1}{1000}$th part of an inch, and which is sufficient to prevent the zero test pin J from entering the concentric hole. By making further divisions in the dial, it is, of course, possible to measure a finer setting distance than $\frac{1}{1000}$th of an inch, were this ever desired. The dial above referred to has notches in it, and a catch engages in the same holding it and the worm securely. The milling cutters are set by means of a similar arrangement to that used for setting the flats. Assuming that the cylinder and flats have been ground, the following means are used to ascertain the distance the flats require lowering:—The screws M are first slackened so that the top of the upright screw K has resting upon it the lug C¹, and, consequently, the bush and disc. As explained above, each half revolution of the dial to the left represents lowering the flats $\frac{1}{1000}$th part of an inch, so that a complete revolution means $\frac{1}{1000}$th of an inch, two complete revolutions $\frac{1}{1000}$th, and so on. The dial would be turned until the wire of the flats "whispered" with the wire of the cylinder, and a note taken of how many turns it had received; then the dial would be turned as many revolutions to the right as it had previously been turned to the left, and thus the bush and disc replaced to normal position as gauged by zero test pin J. The 3 bolts M are then tightened up again. Now, supposing that it has required two complete turns of the dial to make the wire of the flats "whisper" with the wire of the cylinder, this would mean that the flats had been lowered $\frac{1}{1000}$th of an inch, and if it were considered advisable to work the flats $\frac{1}{1000}$th of an inch from the cylinder, it is obvious that the flats would require lowering equal to one complete turn of the dial, which is effected by setting in the milling cutters to this extent, their dials receiving one turn, the principle for gauging which, being, as stated above, exactly the same as that for gauging the setting distance for the flats, and the working flats naturally follow the reduced radius of the disc produced by the milling cutters, the teeth of which are cut spirally. A pair of these milling cutters mounted on their shaft are sufficient for any number of carding engines. Should it be found necessary when the clothing of the cylinder, &c., is renewed, to increase the radius of the revolving disc, this can be done at a very trifling cost by covering the discs with new metal rings or tyres, either in one piece or in segments. To facilitate the grinding of the cylinder, each disc has a removable small segment of the rim, shown in Fig. 2, which allows the grinding roller to traverse beyond the edges of the wire. The next distinct improvement is the slow driving motion, shown in Fig. 3. Behind the pulley A, usually termed the barrow pulley, is the change wheel B, which gears into the doffer wheel G. Behind the change wheel is a helical wheel C, gearing into another helical wheel D, at the bottom of the upright stud E, at the top of which stud is placed a single worm F. When it is required to put the slow motion into action, the lever H is dropped to the bottom of

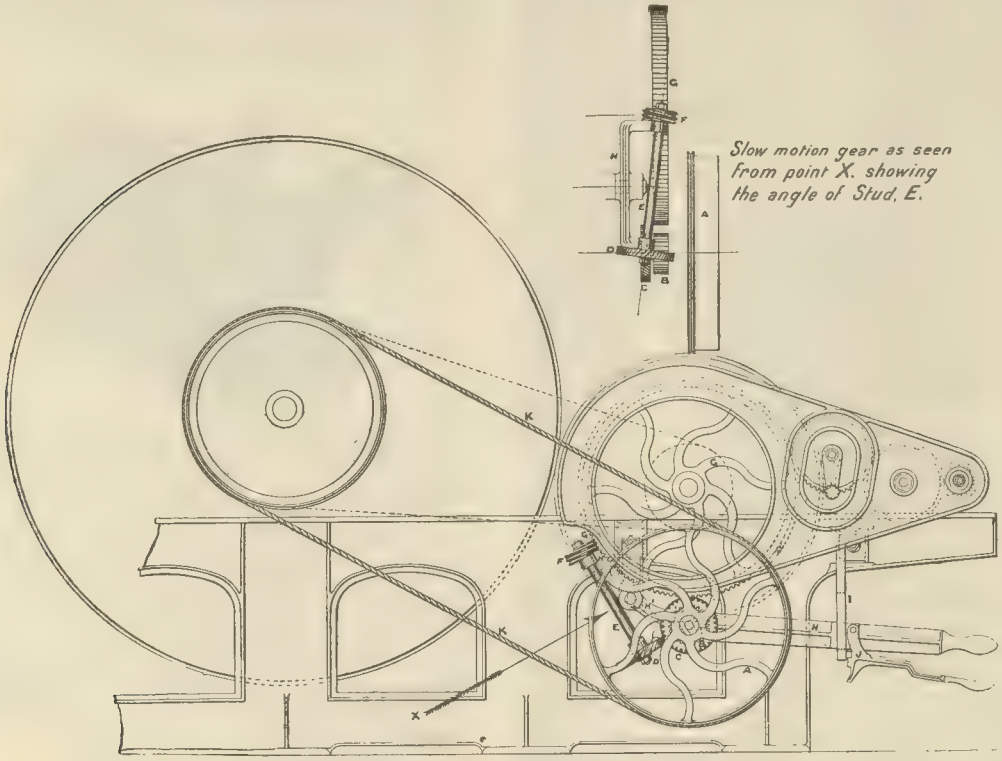
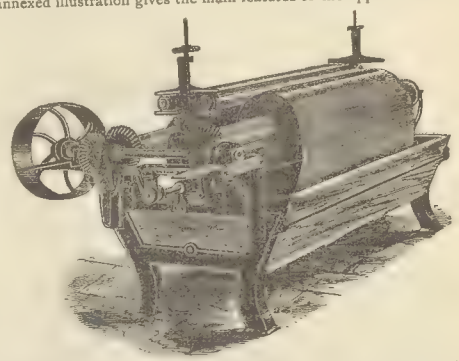


Fig. 3.—Front Elevation of Slow Motion, and Diagram showing Angle of Slow Motion Stud.

the slot in the bracket I, and the change wheel B is thus thrown out of gear with the doffer wheel; the same action puts the worm F into gear with the latter, and revolves it at about one revolution per minute, so that it is always on the move, and prevents the accumulation of cotton between the cylinder and the doffer, and the consequent detriment to the wire of the latter, and when the pinion is again put into gear at full speed, it does not receive the sudden shock which is customary, and to which so many breakages of doffer and barrow wheels are attributable. This slow motion is also brought into use when grinding the wire of the cylinder and doffer, and is then driven as shown by the drawing, viz., from the main pulley on the cylinder, by rope K, the cylinder pulley being specially arranged to be set free for that purpose. When the slow motion is being used for grinding, the doffer makes two revolutions per minute, and the pulley on the other side of the doffer drives back to the cylinder (as shown in dotted lines), turning the latter round at the rate of one revolution per minute, so that the cylinder and doffer make about the same surface speed. As carding engines are run at much higher speeds than was formerly the case, in order to ensure a greater production, it has been necessary to increase the diameter and speed of the doffer, it being now usually made 24 inches diameter, and making from 12 to 18 revolutions per minute; and experience has shown that to suddenly put the doffer on full speed has resulted in many breakages of doffer and barrow wheels, as stated above, and it is claimed that the slow driving motion now introduced *entirely obviates the evil*. The barrow pulley A is not driven from the cylinder, as shown in Fig. 3, when the card is in working order, but from the taker-in as is usual, the rope K only being put on specially for grinding. The advantage of this motion will be recognised by spinners, as it is well known that a careless can tenter will allow a doffer to stand a long time, and thus permit the cotton to collect and rub at the point between the cylinder and the doffer, often causing flat places, as before named, to form on the doffer wire, and the formation of "neps" in the web. These evils are prevented by the application of this slow motion, and as the feed at the taker-in is at a proportionately slow speed to the doffer, the sliver can be pieced up to the can at once. If it is ever desired to stop the doffer entirely, this can be done by putting the centre notch of catch J on lever H, on to the lug in slot of bracket I, and the doffer ceases to revolve, both the wheel and worm being then thrown out of gear. Whilst the feed arrangement is of the ordinary type, *i.e.*, feed roller and dish, there has been applied patent adjustable mote knives, which can be set at any angle to the taker-in, and are adjustable from *outside* the framing by means of a sliding bracket and screw, thus avoiding the inconvenience of getting under the framing to set, or taking out the feed roller and feed plate. This arrangement is a very simple and efficient one. Several other minor points may be mentioned, some of which are also distinct improvements, and though not of very great importance in themselves, yet add to the general stability and good working of the carding engine. The undergrid below the taker-in is connected with, and rests on, one end of a cast iron V bracket or knife, which extends across the carding engine, between the taker-in and the cylinder, and close up to the point of contact between the wire of the two, which enables a better edge to be obtained than would otherwise be the case. Over the taker-in, and between it and the cylinder, is placed another cast iron V or knife occupying a similar position to the one mentioned relatively to the taker-in and cylinder. The knife can, in each instance, be adjusted independently of the taker-in, and form a cover or filling up piece, leaving about 1 inch of space for the point of contact. An adjustable steel cover is placed between the top knife and the point when the top flats commence to do their work, and which acts as a knife at the point of contact to prevent draughts and accumulation of dirt, &c. The cylinder undercasing, made of tin angle bars, and connected at the ends, rests against a cast iron V shaped knife at each end, and is supported in the middle by semi-circular framing made adjustable. The end of the grid, nearest the doffer, does not extend to the point of contact between the latter and the cylinder, but is continued by one side of the V shaped knife, the other side of this knife being ⅛ inch distance from the wire of the doffer, so as to prevent any short fibres, etc., from coming between the doffer and the cylinder at this point. These knives, in addition to serving the purposes named, also act as extra stays between the sides of the carding engine, and, consequently, tend to increase its stability. At each end of the doffer is placed a steel plate to keep up and preserve the edge of the card clothing. The doffer is partially covered with a circular steel shell, as is also that part of the cylinder between the point when the flats leave it and the doffer, and when the cylinder requires to be ground, this cylinder shell is so arranged that it can be easily lifted forward to allow space for the grinding roller and stripping out brush. A cast iron V shaped knife is placed between the doffer and the cylinder, upon which the two covers rest, and this knife is extended down between the wires, in a similar manner to the one named above, between the taker-in and the cylinder. Again, provision is made so that the knife can be adjusted independently of the doffer, being carried on a separate moveable bend which extends round to the front of the doffer, and bolted to the carding engine side, forming, in addition, a steady support for the grinding roller. The doffing comb is on Brooks's well known principle, many thousands having been applied to carding engines made by other machinists. The special construction of the callender box prevents roller laps from forming either on the top or bottom callender roller, and Hollands' web conductor is also applied. The taker-in is covered with inserted saw tooth wire, and the cylinder, doffer, and flats, are covered throughout with hardened and tempered needle-pointed steel wire clothing, and there is the usual stripping-out brush and comb for cleaning the flats. The gearing throughout is well protected, and every endeavour will be made with the aid of special tools, skilful workmanship, and careful supervision, to give entire satisfaction with regard to the fitting and general completion of the carding engines, and the reputation the firm have already acquired for their other machinery will doubtless provide sufficient guarantee upon these points. All communications concerning these machines should be addressed to S. Brooks, Union Iron Works, West Gorton, Manchester.

Improved Burl-Dyeing Machine.

Amongst the recent patents applied for, in connection with textile apparatus, is an invention for an improved automatic reversing mechanism for burl-dyeing machines. There have been many effective improvements for a similar purpose put before users during recent years, but, for simplicity of mechanism and effectiveness in its operations, this apparatus is a decided advance on those previously in use. Mr. J. D. Asquith, Queen's Mills, Morley, near Leeds, who is the inventor and maker of the machine, has spent much time and thought in its perfection, with a very satisfactory result, and, undoubtedly, he ought to reap a substantial benefit from it. It is well known amongst users of burl-dyeing machines, that, when the fabric has to be dyed, it is put upon a roller at one side of the vessel which contains the liquid dye, and is then unwound on to another roller on the opposite side of the machine. When undergoing the operation, the material passes under guide rollers immersed in the dye vessel. After it has been unwound and wound again from one roller to the other, an attendant, by operating a clutch, throws the winding-on roller into gear with a positive driving mechanism, thus causing the motion of the two rollers to be reversed, and, in consequence, the piece is wound the reverse way. This reversing operation is repeated, either by hand or by suitable mechanism, until the fabric has been sufficiently dyed. In carrying out his improvement, Mr. J. D. Asquith makes the clutch self-acting, so that an attendant is dispensed with. The annexed illustration gives the main features of the apparatus. A shaft



runs across the centre of the machine, to which three iron arms are fixed, one of which operates the clutch, and to the other two are attached bearings and slide rollers and two *upper* rollers, the latter being for the purpose of working on the fabric wrapping round the roller at one side of the machine, which it does in such a manner as to cause a reversal of the rollers and to rewind the fabric on to the roller at the opposite side of the machine. The two *upper* rollers are fixed by their ends on to iron bars which slide through two boxes, one at each end of the machine, the boxes being fixed upon upright arms, keyed or fastened to the above-mentioned shaft, which runs across the centre of the machine. The boxes are moveable, and are made to slide up or down the upright arms so as to suit different lengths of fabrics that have to be wrapped upon the rollers. In addition to the above mechanism, the machine has an improved brake fixed to the friction pulley; this consists of half the usual friction straps generally employed to each roller, the bottom part being fast, whilst to the upper part an iron rod is secured that regulates the brake automatically. When working the fabric from one roller to the other, there is, of course, a gradual increase of fabric upon one roller and a lessening upon the other. Whilst this is going on, the *upper* roller, which is working against the former, is gradually pushed back by the bars at the ends of the *upper* rollers sliding back until the fabric roller is full, when the mechanism is acted upon, and the fabric rewound upon the reverse roller.

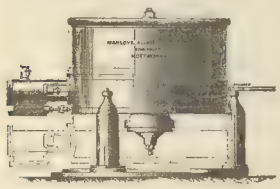
Messrs. E. Hoyle and Sons, Limited, Halifax.

In the making of textile machinery, the above firm have been well known for a considerable number of years, not only in this country, but abroad. Large quantities of their productions found their way into the United States, when that country was not in quite so good a position for making its own machinery as it is at the present time. In order to keep well up with the requirements of the times, Messrs. E. Hoyle and Sons are continually adding the latest improvements to every machine they make, foremost amongst which are machines for dyeing and finishing cotton velvets, velvets, plushes, &c. These include treadles, pegging machines, jiggers, tubs, cutting machines; waxing, painting, and brushing machines; horizontal hydro-extractors; finishing tables; singeing, drying, tentering, and washing machines; damping sheds; wood cisterns; wood winches, &c. These are of the newest construction, as are also the machines for dyeing, drying and finishing all kinds of Bradford manufactured goods. It would take up a considerable space to enumerate the many classes of machinery made by this firm, but the following are amongst the most prominent:—hydraulic and screw presses; cotton baling presses and boxes; patent wrought iron steam press plates, and glands for press cylinders; hydraulic pumps of every description; dyeing machines for blacking, blueing, buffing, saddening, chroming, padding, jigging, and washing-off machines; melange machinery for dyeing, drying, and printing

of wool "sliver; patent steaming apparatus, and black rolling and steaming apparatus; improved felt hardening machines; wet and dry finishing and tinting machinery for mohairs, lustres, poplins, &c.; wet finishing machines, with from one to seven pairs of nip rollers, with drying machines attached; poplin machines for paraffin wax stiffening; gas singeing and brushing machines; tinting machines, with from one to three sets of nip rollers; warp dyeing machinery, bleaching and sizing drying machines, for cotton and other warps; patent expanders to keep pieces out at width; hydro-extractors, both turned from underneath and above; grinding mills for indigo, lac, and argols; soap scouring machines; milling machines, and hot-air tentering and drying machines for the "estimane" finish; steam engines of all descriptions; Messrs. Ingham and Butterfield's patent rigging machines; calenders made with wood, iron, copper, and brass bowls; horizontal hydro-extractors with copper cylinders; damping machines; cold calendering machines with five rollers; improved Lancashire jiggers and Glover's patent self-acting reversing motion; wee gees, jiggers, &c.

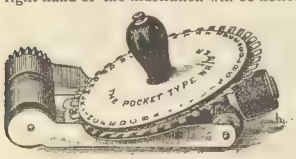
Improved Hydro-Extractor.

A valuable improvement has been patented by Messrs. Alliott and Haughton, of Nottingham, and is being added to the hydro-extractors made by Messrs. Manlove, Alliott and Co., Limited, of the same town, which, under certain conditions, will prove of great advantage to users of this class of machinery. It relates most particularly to machines which have an engine attached underneath, and are suspended upon rods, and as, in many places, it is a rather difficult matter to employ other types of machines, the improvement will no doubt be welcomed. In fixing this kind of machine, it has been the practice to construct a small pit, or to make its equivalent by cutting a hole in the floor in order to allow of an examination being made easily when such was necessary. In cases where conditions have not allowed either a pit, or holes to be cut, as in fireproof flooring, &c., it has been usual to turn the machine upon its side; this, of course, has entailed a serious waste of time and labour, with a result that machines have usually been run much too long between the examinations. The improvement obviates much of this loss by the simple arrangement shown in the illustration. The suspension rods are made with a screw thread along their whole length, and the vibrating joint in the foot of the pan forms a nut fitting the long screw. The upper end of the suspension rod or screw is square, and it may be turned by a handle or spanner, by which means the machine can, at a moment's notice, be raised about 18 inches, or of a sufficient height to enable a man to easily examine the working parts. The dotted lines shew the machine in its working position, and the full lines as it is raised for examination.



The Miniature Pocket Type Writer.

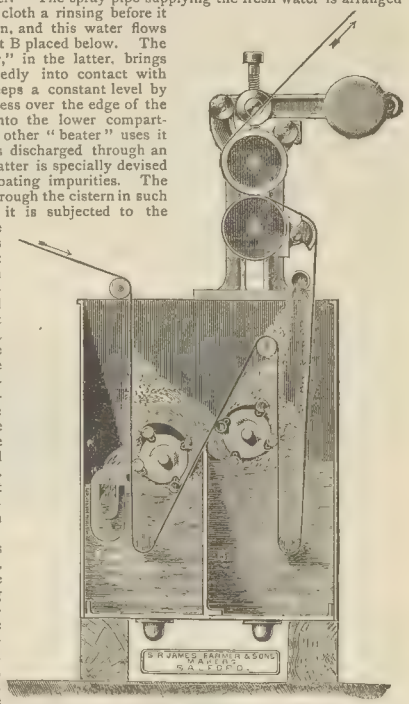
One of the most ingenious little machines we have seen for some time is the miniature pocket type writer. From an illustration, an idea may be gained as to its mechanism, which is very simple, whilst the machine only measures 4 in. by 3 in., and weighs less than 4½ ozs. The circular dial, which is enamelled, contains all the letters of the alphabet and other characters necessary for correspondence clearly marked around its edge. In a corresponding position, beneath the plate, are the same letters and characters made of india rubber. It will be noticed that around the extreme edge of the dial are tooth-like projections placed between the letters which, in connection with a pin, act as a guide in operating the machine. On the right hand of the illustration will be noticed the roller for inking the type. To the left is a roller, on one side being pins. To work the machine, a couple of fingers of the left hand revolve the latter roller, the pins acting as a guide, the distance between each pin representing the distance between the letters when written. This shows how the machine travels over the paper. At the same time, the right hand is employed in setting the letters in position by means of the knob in the centre of the dial. The illustration shows the letter "K" being printed. This is really a machine, not a toy. We have seen it at work, and have also seen specimens of letters written by it, and copied in the ordinary manner. A few of the advantages of the machine may here be noted. First its size, weight, and low price (10s. 6d.) are worthy of mention. The writing is visible to the operator, thus the chances of mistakes are greatly reduced. It will work in almost any position, moving bodily across the paper, no matter what size the paper may be. It will write in a book or on a wall and on linen of any description just as easily as upon paper. The machine is finished in a first rate manner, all the metal work being nickel plated. It has already met with much approval by the general public, the sales to various parts of the country having been large, and it has also been highly spoken of by scientific men, as being a very ingenious and practical apparatus. The machine may be had from the Miniature Pocket Type Writer Company, Swan Arcade, Bradford.



Miniature Pocket Type Writer.

Farmer's New Patent Open Washing Machine.

The essential conditions aimed at in this new open washing machine to answer the various purposes it is intended for, are as follow:—1. To utilise the water as completely as possible, so as to require a minimum amount for a given effect. 2. To loosen and remove in the open state all foreign matter. 3. Not to injure the surface or the texture of the cloth while it is subjected to the washing action, and to give it the least possible strain. 4. To make the apparatus as simple as possible. The engraving herewith conveys a clear idea of the way this washing cistern is adapted to meet these conditions. The cistern is preferably divided into two compartments, A and B, the water level being higher in B than in A. Each compartment is fitted with a special washing apparatus, which forms the chief feature of the system, and in order to make our description clear, we call it a "washing beater." The spray pipe supplying the fresh water is arranged so as to give the cloth a rinsing before it leaves the cistern, and this water flows into compartment B placed below. The "washing beater," in the latter, brings the water repeatedly into contact with the cloth, and keeps a constant level by throwing the excess over the edge of the partition plate into the lower compartment, where the other "beater" uses it again before it is discharged through an overflow. The latter is specially devised to run off all floating impurities. The cloth is guided through the cistern in such a manner that it is subjected to the action of the washing beaters on both sides; it enters the cistern through the compartment A, and leaves it again at B — viz., in a direction opposite to that of the water. Few binding rollers are necessary to guide it, so that the strain on the cloth is reduced to a minimum. Farmer's patent "washing beaters" consist each of a shaft carrying two end plates or spider wheels, on which are fitted oscillating brass pipes, generally four. These pipes are constructed with eccentric necks, which allow them to swivel on the plates, and a slot or slit is cut along their whole length so that they form a sort of oscillating bucket. The centre of the beater is placed above the level of the water, at a convenient distance, to allow the pipes to be submerged at their lower position, and thus to fill with water. When revolving, the centrifugal force causes the pipes to stand out from the centre of the beater. The slightest touch, however, causes them to give way, so that when, for instance, they strike the cloth, the latter receives a dead blow (without friction) as the pipe swivels back around its eccentric centres. The slot cut along the side of this pipe is thus partly turned, so that the centrifugal force causes the water to be thrown out and projected with great force against and through the cloth. The beating and washing actions thus take place simultaneously, which causes them to give the best possible effect. Each beater has two contacts with the cloth, and its rotation allows the pipes to carry part of the water, after their first contact, to the second contact, where they are emptied altogether. Besides the water contained in the pipes, the rotation causes an extra quantity of liquid to be carried round the beater, which quantity is in proportion to the speed. This extra volume of water forms a kind of continuous jet, as shown on illustration, which breaks against the cloth, and the latter, moreover, receives from the beaters a quick to and fro motion during the whole time it passes through the liquor. Thus the apparatus, in spite of its simple construction, has an extremely effective compound action which can only be really and properly understood by seeing it at work. The power absorbed at a normal speed of about 300 revolutions is very small, and amounts to merely a fraction of a horse-power. The water beaters are also applied to water mangles, as used in dyeworks, printworks, &c. They are also applied with success to dye jiggers, whilst the water beater cisterns applied to open washing or soaping ranges are equally efficient. One of these patent beater cisterns can be seen in operation at Sir James Farmer and Sons, Adelphi Ironworks, Salford, Manchester, and a piece of goods will be washed for any firm interested in the matter. A working model, by means of which the principles of the apparatus are practically demonstrated, can also be submitted to parties interested, and full particulars will be gladly supplied.



Farmer's New Patent Open Washing Machine.

PATENTS.

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Jacquard harness. W. and H. A. Fielding, Manchester.	18th Jan.	922
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Looms for stripes, checks, &c. E. Hollingworth, Huddersfield.	10th Jan.	455
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Patents Sealed.

14,610	14,646	16,236	16,925	17,102	17,201	17,591	17,611
17,661	17,916	17,977	5,077	11,232	13,194	13,827	16,307
17,782	17,805	17,879	17,978	17,995	3,032	6,847	11,457
11,696	13,953	14,039	14,141	15,097	16,627	17,563	17,891
150	215	329	336	427	440	11,152	13,592
14,514	8,355	17,254	17,640	467	494	495	535
606	688	877	1,015	1,084	1,346	2,343	11,310
1,140	13,560						

Printed for the Publishers by JOHN DALE & CO., 17, *Bridge Street, Bradford, and Published by* HORATIO LORD *and* RICHARD THOMAS LORD, *at* 10, *Ann Place, Little Horton Lane, Bradford.*

The Journal of Fabrics AND Textile Industries.

Vol. 15. No. 91. MARCH 12th, 1889. Price 10d.

Contents.

Notices.

The Yearly Subscription—payable in advance—including home postage, is 10s. Cheques and Post Office-Orders to be made payable to H. & R. T. LORD, 10, Ann Place, Little Horton Lane, Bradford, Yorkshire.

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To prevent any misunderstanding, all Articles sent to the *Journal of Fabrics and Textile Industries* for publication will be considered as offered *gratuitously*, unless it is stated explicitly that remuneration is expected

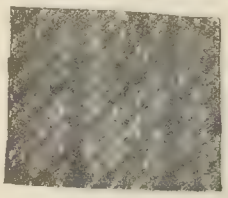
Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.

New Worsted, Woollen, and Cotton Patterns for Spring and Summer Seasons, 1890.

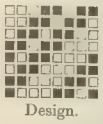
As the seasons come round, year after year, there are more novel and striking effects being produced in various styles and combinations of yarns and cloths, and the fabrics likely to be in fashion during the spring and summer seasons of 1890 will be, in point of merit, an advance on the productions of former years. Since so much energy was shown in the founding of technical schools in this country, rapid strides have been taken in the various departments of the textile trades, and in none, we venture to assert, has there been so much advancement made as in the worsted and woollen branches. As regards the excellence in spinning, weaving, dyeing, and finishing of cloths, there can be no denying the fact that the fabrics being produced in the worsted and woollen districts of this country compare most favourably with those imported from the Continent, and, in many respects, producers are considerably ahead of their Continental rivals. In the new patterns before us, worsteds claim the first attention. In this department, there are some admirable specimens which, if not novel, still are such as will undoubtedly find a good market at home and abroad. The majority of the samples are in fine yarns, but with the designs of a bold character, the over-check being a prominent feature, with a smaller check forming a ground work. Many of the specimens have the over-check of corded or silk mixture yarns, in the latter case, the check is not so prominent as in the former, but both are of an effective character. In colouring, the combinations are of such a variety that they can hardly be particularised, but, generally, for coatings, the ground is all of one shade, and the checking in different colouring. In stripes, corded effects are also prominent, and silk is much utilised; whilst in the majority of cases the patterns are of a bolder character than for some time past, in others there are very neat silk mixtures, which will meet with much attention. In the rougher makes of cloths in which fancy yarns are the predominant feature, there is but slight change from last season, and the opinion seems to prevail that this class will not have the hold on the market which it has recently had, unless some decided novelty in yarns is introduced. In woollens, although checks and stripes in small effects may have a fair sale, the tendency seems to be for bold styles with a profusion of high colouring. In the Cheviot class, this tendency is very marked, the patterns being mostly of a cloudy and broken character, and of a rather rough looking nature, with bright colouring. In trouserings and also in many suiting patterns, the ground stripes are from one-quarter to three-quarters of an inch broad, in brilliant colouring, whilst a one-eighth inch stripe in a more solid colour gives decision to the whole. Many of the above patterns have also narrow stripes running diagonally across them. A specimen of this class is illustrated below. In checks, the patterns are not so decided as the stripes, many of them showing a slight combination of check and stripe, the former being most prominent. In the smoother class of woollens, high colour is also used, with a tendency to similar patterns as in Cheviots, but somewhat less, and especially is this the case in cloths suitable for the ready made clothing trade. A few patterns in fine wools have a "draw" finish, which gives a very smooth and silky touch, but it is not likely that this description will be much called for during 1890. They are, in point of design, in neater styles, whilst in the combination of colourings they are quite equal, if not superior, to those above described. As usual, we can forward packets of patterns of these cloths at £2 per 100 samples. In ordering, to ensure patterns most adapted to individual requirements, it is requested that a few cuttings of fabrics being generally made should be sent us as samples. We have selected three patterns of cloth from our Spring and Summer collection, which we illustrate, together with the designs and particulars for weaving them. They are good examples of the styles likely to be in demand. The first, No. 1. is a Cheviot, a combination of diagonal and stripe. The colours—light and dark grey and dark brown predominate, the diagonal and stripe thus showing at a short distance on a grey surface. The other colours, such as the red and cream twist, are disposed over the surface in the form of splashes, and have an effective appearance, which, however, it was not possible to show in our engraving. The following are the particulars for weaving this pattern:—

No. 1.



Warp:—

4 ends	Dark Brown,	2/24 silk.
4 ,,	Light Grey,	,,
1 end	Red and Cream twist	,,
1 ,,	White and Brown	,, ,,
3 ,,	Dark Grey,	,,
1 ,,	Red and Cream twist	,,
1 ,,	White and Brown	,, ,,
3 ,,	Dark Grey,	,,
1 ,,	Red and Cream twist	,,
1 ,,	White and Brown	,, ,,
4 ,,	Light Grey,	



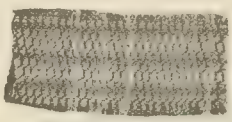
Design.

Woven:—24 picks per inch.
10 skeins Dark Brown woollen

1,920 ends in warp; 30 ends per inch; 10's reed, 3 ends in a dent; 8 healds; 64 inches wide in loom; 56 inches wide when finished. Weight 20 ozs. per yard.

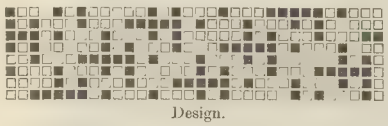
The next engraving shows a pattern of worsted suiting. This is a very effective combination of colour. The downward stripes consist of light brown and cream, and the cross stripes of claret, with the network in dark brown. In general appearance and weight of colour, the pattern much resembles our engraving. The particulars for weaving are as follow:—

No. 2.



Warp:—

60 ends	Dark Brown,	2/40 worsted.
8 ,,	Light ,,	,,
8 ,,	Cream,	,,
16 ,,	Dark Brown	,,
8 ,,	Light ,,	,,
8 ,,	Cream.	,,
16 ,,	Dark Brown,	,,
8 ,,	Light ,,	,,
8 ,,	Cream,	,,



Design.

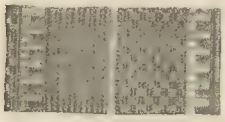
Weft:—2 picks Claret, 2/40 worsted.
4 ,, Cream, ,,
6 ,, White, ,,

7,680 ends in warp; 120 ends per inch; woven in a 15's reed, 8 ends in a reed; 56 picks per inch; 64 inches wide in the loom; 56 inches wide when finished. Weight 16 ozs.

We give a third illustration—a worsted trousering being selected for this purpose. It shows a pattern of stripes somewhat wide apart. The surface of the cloth is composed alternately of cord and hopsack, divided by stripes of colour. The effect of this pattern will be that of a dark green surface, relieved by the lighter shades given in our particulars. This pattern is capable of many changes in colour, for instance, indigo, or navy blue, might be the prevailing colour, the narrow stripe being in cream,

and the broader in very dark red. Many other combinations will suggest themselves for this pattern. The following are the particulars for weaving :—

No. 3.

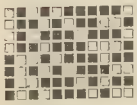


1,752 ends cotton; 1,152 ends worsted; 32 ends per inch cotton; 128 ends per inch worsted; 16's reed; cotton, 2 ends in a dent; worsted, 8 ends in a dent; 64 inches wide in the loom; 56 inches wide when finished.

Weight 16 ozs. per yard.

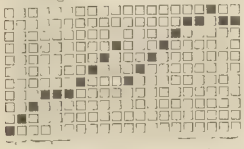
Woven :—90 picks per inch, 2/38's worsted.

Warp :—



2/40's worsted, 8 ends Brown, } 8 ends in a reed.
" 1 end Brown, } 8 times, }
" 1 " Dark Green, } }
6's cotton, 24 ends Dark Green, 2 ends in a reed.
2/40's worsted, 6 " Light Brown, } 8 ends in a reed.
" 2 " Dark " }
6's cotton, 24 " Dark Green 2 ends in a reed.

Design.

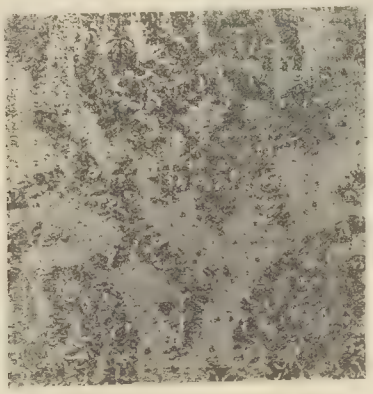


12 times. 6 times. Draft. 4 times.

12 times. 6 times. Pegging Plan. 4 times.

In the foregoing, reference is made only to cloths for gentlemen's wear. We now propose to devote a few remarks to those patterns specially adapted for ladies. First, we will take mantle cloths :—In these there is a number of novelties—the most striking of them being in double cloths, although of light weight. According to the selection of patterns before us, bold designs appear to prevail. Some of the samples

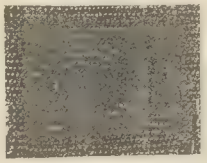
No. 4.



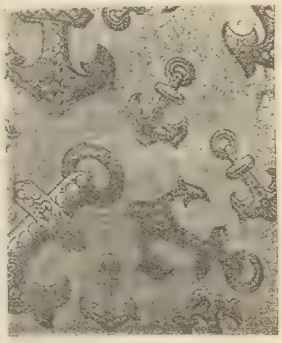
No. 5.

owe their pattern to the jacquard, in some cases, one repeat of a design occupying 6 or 7 inches in width, and whilst this shows quite distinctly on one side, it is somewhat misty and indistinct on the other, owing to the particularly woolly finish which is given. There are some neat things in diagonal worsteds, the face of which is in stripes graduated in colour from dark to light, for instance, from dark brown to grey. These are made also with a soft woolly backing, some of grey and others of scarlet. It is scarcely possible to properly describe such patterns within the scope of an article in this Journal. We may, however, say that the jacquard designs mostly partake of an ornamental character—some in scrolls, others of a more set description. The colours used embrace a rather wide range.

No. 6.

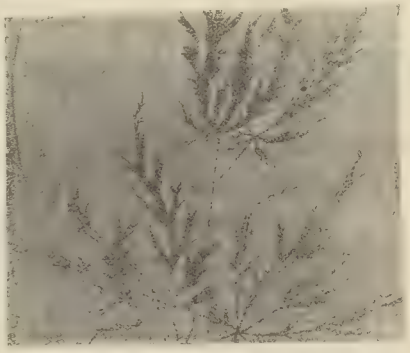


No. 7.



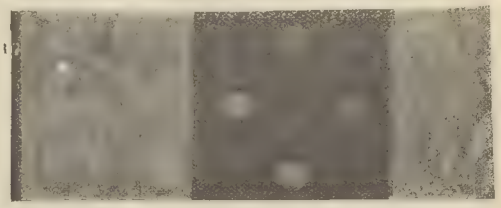
In one specimen, we have brown and grey on one side, and and indigo and grey on the other. In one or two, we have brown and fawn both for face and back. In another, olive green and fawn, shot at intervals with red and blue; there is also indigo with a pattern in red and white. Scarlet and indigo are used in another very novel design. No. 4 illustrates a mantle cloth which has a reversible pattern. This is woven in a light grey worsted ground, the figure being composed of black curled worsted and white curled silk twisted together. The design has a rough but novel appearance. There are several specimens of this description in a variety of colourings, such as two greys and white; brown, black, and white; olive green, black, and white, &c. We are able to supply a few

No. 8.



cuttings of this cloth at 1s. each, to anyone interested in this style of manufacture. Turning to dress materials, the same tendency towards large designs is exhibited, whether they are woven or printed. No. 5 is an illustration of an all wool sample, having balls of varying sizes in an oval formation, these being in pale French grey upon electric blue ground. There is an almost endless variety in colour, design, and material. Some taking things appear in worsted gauze cloths, one of which

No. 9.



we illustrate. No. 6 is a triangular diaper in maroon, dotted with gold silk; it has a pleasing appearance, somewhat similar to that of tinsel, with the advantage of being more durable. There is scarcely an end to the

pretty effects which may be gained with a cloth of this description. As an example, the maroon might be dotted with light pink, blue, grey, or salmon. Some of the samples have chenille stripes in varying shades, others have stripes of silk. Then there are lace cloths, some of which are reversible or double cloths. But in these, as in mantle cloths, the jacquard plays no inconsiderable part. Floral stripes, with ornamental ones intervening; silk stripes, alternated with plain wool ones; and, in some cases, bold scroll stripes are very prominent, which shows that these are not so easy to displace as was considered by those who predicted that they had had their day. Then there are some really bold ornamental designs, many of which are very effective, but others cannot be considered anything but ugly. They are in all varieties of styles, both as regards material and colour, as well as ornamentation. A few checks appear, mostly of a bold nature. Printed mousselines de laine show some very pretty effects. We have endeavoured to reproduce two of these, the first of which consists of an arrangement of anchors in black, light grey, and white, on a dark grey ground, shown in No. 7; the other is of a more elaborate character, comprising feathery leaves and grasses in dark blue, light blue, brown, and red, on a cream ground, the first of these colours predominating. This is rather an extensive pattern, and we are, therefore, unable to show the whole of it. In printed cottons, there are many good things, some of these likewise being large in pattern. We show one consising of alternate stripes of maroon with white balls upon it and of white with dark blue scrolls. Other samples partake of both the floral and ornamental character of design.

Sick and Accident Fund for Workpeople.

We have much pleasure in giving space to the subjoined letter received from Messrs. Thomas Fletcher and Co., relative to the providing of a sick fund for his employés. The system, to us, seems to recommend itself and, if it were generally adopted, many sick workpeople would be in a much better position than they now occupy.

To the Editors of the Journal of Fabrics and Textile Industries,

Gentlemen,

We think it desirable that the attention of employers of labour should be called to a system we have adopted with extraordinary success for some time past with our employés. It is a common custom where many people are employed to make a subscription for any who are sick, or have met with any accident, but we have found this most unsatisfactory, and after long consideration we have adopted the following system, which we find works perfectly in practice, and has been of the greatest benefit to all concerned. Experience has proved that, on the average, out of each 200 workpeople, one is either ill or disabled by accident, and that it is not necessary to provide for more than an average of one in 200 on the sick list each week. This, of course, varies, as we have had four times this percentage at once; but, on the other hand, we are often several weeks entirely clear. This is naturally a question of individual experience. Our own risks, as makers of gas heating appliances in large and well-ventilated workshops, are, perhaps, under the average. Every boy earning up to 10s. weekly subscribes one halfpenny per week; labourers earning under 20s., one penny; and all others three-halfpence. Of the total amount subscribed, one-tenth is paid annually to the local infirmary, and the balance is utilized for the benefit of the subscribers as follows:—A committee of at least 12 of the workmen is elected by ballot annually. Two of these visit every case of sickness and accident weekly in rotation, and report to the foreman the necessities of each individual case; and these two of the committee, along with the foreman, decide the amount which shall be paid, this, in any case, not exceeding, as a maximum, two-thirds of the average wages received. Every man or boy must be on the sick or accident list for a week before he is entitled to any payment, and the amount he is entitled to depends entirely on the judgment of the visiting committee, who are themselves personally interested in the payment and utilization of the funds. We started the club with a small capital as a reserve fund, which has never been encroached on, and the whole affair is satisfactory in every respect. The rule is that no fund shall be accumulated beyond £20, but if any exceptionally sickly period shall occur, we have power to double the subscriptions for the time if necessary. Those subject to chronic diseases, who would not be admitted into any sick club, are excluded, but the committee have power, if the funds will permit, to assist any such cases as a matter of charity and of good feeling in any worthy cases. The practical result is that the subscriptions are about one-sixth what are required in any ordinary sick club, that deserving cases get kindly attention and extra payment, and that the funds are increasing. We find, in fact, that an average subscription of one penny per week provides sufficient funds to cover all liabilities as to sickness and accident from the day any workman enters our service until the day he leaves it. The club, of course, provides for present necessities only, and any person leaving us has no claim whatever, the club simply insures him whilst he is in our employ. If the balance exceeds £20, the payments will be stopped until the funds get below this amount, as we do not want present employés to subscribe for the benefit of those who come after them. We shall be pleased to send a copy of our rules to any firm who wish to adopt the same system.

THOS. FLETCHER AND CO.,
Manufacturers of Gas Heating Appliances, Warrington.

Diagonal Cloths.

Now that the prevailing fashion in coatings is to have very large diagonals, a few words as to how they are made will not be out of place. Most of the patterns spoken of are woven with a large number of healds, and, generally, take the form of "corkscrew" combined with some other arrangement, such as satin, or rolling twill. A few examples of these are given in Figs. 1 to 9 on our second plate. In Figs. 1, 2, 6, 7, 8 and 9, we are not able to show the whole of the patterns, but, in the description of each figure, the number of picks required to complete it is given, therefore, they will be easily understood. Fig. 1 is a combination of an ordinary 7-end warp corkscrew, with a 5-end weft satin, upon 35 ends, and it will require 105 picks to complete it, as the diagonal moves one end for every three picks inserted, therefore, before it has moved over the 35 ends, it will have occupied 35 times three picks,—or 105, but, in determining where the pattern will be complete, we have another factor to consider, viz., the 5-end satin, although we can afford to ignore its claims in this case as the pattern is determined by the warp diagonal, while the satin is simply used to fill the space between the diagonals, and is made to join the diagonal the same on each side, so that we shall have 35 sets of satin in the complete pattern, or one for each step of the diagonal. Fig. 2 is a similar pattern to Fig. 1, only 3 and 3 weft cord is substituted for the "corkscrew," while the same 5-end satin is used to fill up the space between the diagonals. This pattern is upon 34 ends, as, each side of the cord being the same, 5-end satin would not join perfectly to each side if it was upon 35 ends, as in the last case. We may use the same process of reasoning in determining where the pattern will be complete as we used in Fig. 1, viz., the diagonal moving one end for every three picks, we shall have to carry the pattern forward to 34 times three picks before it is complete, or to 102 picks, and we shall also find that the 5-end satin is not a measure of 102, but the satin is, nevertheless, complete, as we have 34 sets, or lines of satin, one corresponding to each step in the diagonal, and as each line of satin is made to join the same on each side to the diagonal, we need not trouble ourselves about its not being a measure, all we have to consider being the diagonal itself, and then make the satin subservient to it. Another very fruitful source for this class of diagonal, is combining two or more simple patterns together, pick and pick, the main consideration being to let the twills come together in such relation that they will form very distinct lines, running in a diagonal direction. Figs. 3, 4 and 5 are simple twills upon 26 ends, and Fig. 6 is a diagonal arranged by combining Figs. 3 and 4 together, a pick of each alternately, the design being complete upon 52 picks, or the sum of the two simple twills. Taking these two twills as a basis, we might make 26 different combinations by placing them in all the positions possible in relation to each other, or, in other words, if we let Fig. 3 remain in the same position for 26 different patterns, we can place Fig. 4 in 26 different positions in relation to it, by letting Fig. 6 be the first position; then for the second position, beginning Fig. 4 upon the second end, and carrying it out as an ordinary twill in relation to Fig. 3; for the third position, we should begin Fig. 4 on the third end instead of the second, and on the fourth end for the fourth position, and so on for the 26 different positions or patterns, thus ensuring that the two twills will be in all the positions possible in relation to each other when the series is complete, though, of course, each pattern will not be equally good and serviceable for this class of diagonals, but it is a field for producing new patterns that is practically inexhaustible. Fig. 7 is a diagonal of a similar character to Fig. 6, made by a combination of Figs. 3, 4 and 5, arranged a pick of each alternately, the whole being complete upon 78 picks, or 3 times 26, and the angle of the twill will be higher than in Fig. 6, in fact, the angle at which the diagonal should run across the cloth will, in most cases, determine whether the pattern should be a combination of two, three or four simple twills, and the character of the diagonal and the build of the cloth will determine the class of pattern to be selected for the combination. If the diagonal should be large and prominent, and the cloth fairly heavy, patterns having plenty of float should be chosen; if, on the other hand, the diagonal should be sharply defined and the cloth light, patterns having very little float should be chosen, or patterns that have plenty of variety of line in them. In arranging patterns upon the principle of Fig. 7, we can keep Figs. 3 and 4 in the same position, while we move Fig. 5 26 times in relation to them, then we might keep Figs. 4 and 5 in the same position, while we move Fig. 3 25 times in relation to them, or, in other words, in the first series, Fig. 5 will have been placed in all the positions possible in relation to Figs. 3 and 4, and, in the second series, Fig. 3 will be placed in all the positions possible in relation to Figs. 4 and 5, thus placing the three patterns in all the positions possible. In the second series, there will be one position less than in the first, because 3, 4, and 5 had been in all positions in the first series, therefore, when we move Fig. 3 in the second series, it will have already been in one position in relation to Figs. 4 and 5. Fig. 8 is a combination of two 7 end twills with each other, and carried forward to 36 ends, leaving a space of 9 for a diagonal of warp cord, the whole being complete upon 72 picks. Fig. 9 is a similar pattern to Fig. 8, being a combination of two 8 end twills-pick and pick upon 36 ends, with a diagonal of weft, the whole being upon 72 picks. For a light cloth—say 17 ozs. per yard—the following particulars are very applicable:—2/32's worsted warp, woven with 84 ends per inch; 2/30's worsted weft, 78 picks per inch. For a heavy cloth—say about 22 ozs. per yard—the following would make a good cloth:—2/28's, 80 ends per inch, 9's weft, 72 picks per inch.

Automatic Sprinklers or Fire Extinguishers.

In our January issue, we gave particulars and a description of the mechanism of the "Neptune" sprinkler, made by Messrs. E. Walker and Co., Engineers, Heckmondwike, since which time the apparatus has been in the hands of the Mutual Insurance Company for the purpose of making tests as to its efficiency. The result of these we hope to refer to later. Since writing our last article, application has been made at the Patent Office for protection for the invention of two or three improved sprinklers; what the merits of these may be we are at present unable to say, but descriptions of them will probably be given shortly, which will enable our readers to judge of the advantages claimed for each. In the meantime, we propose to devote further space to giving particulars of those that are now before the public. These are the "Witter," made by Messrs. Witter and Son, Crown Works, Bolton, the "Watchman," patented by Messrs. Crawshaw and Tonge, Henry Street, Rochdale, and the "Draper-Hetherington," by Messrs. Hetherington and Co., Ancoats, Manchester. The first, which we had the opportunity of seeing thoroughly tested a short time ago, has had its merits sifted by accidental fires, and, on each occasion, has proved effectual in extinguishing the flames before any serious damage was done. This in itself proves that it has its good points, and that it may be relied upon to do its work effectually. The following description of its mechanism will be readily understood:—Fig. 1 shows the sprinkler—which is made of bell metal—as it appears when attached to the installation pipes, and before it has been brought into action by heat from a fire. The illustration is two-thirds of the actual size, which is four inches in depth and two and a half in width, measured from outside

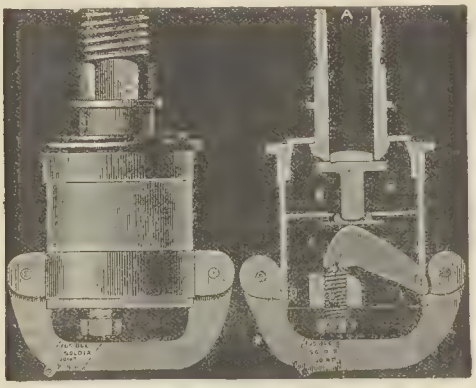


Fig. 1. Fig. 2.

to outside of the ears. Fig. 2 shows the inside of the sprinkler. When screwed into position on the installation pipes, that part of the apparatus marked A is charged with water, which exerts a pressure upon the valve B, which, in the inactive state of the sprinkler, prevents the water from entering the shower chamber G. In order to secure a perfect joint, and thus prevent the possibility of leakage, the face of the valve is covered with an alloy somewhat exceeding in hardness that of lead, and which is, at the same time, non-corrosive. The valve is held to its seat by a curved lever or bridge marked C, the upper part of which is wide, and so shaped as to bring it in contact with the underside of a loose seat in which the stem of the valve rests. The curved lever C is held in its position at one end by the point of a set screw E, by which the lever can be adjusted to its exact place, and at the other end by another lever marked F, which Mr. Witter, not inaptly, calls a swing lever. The lever F is held in its position by a corresponding lever H, which are united together by a solder, composed principally of tin, lead, and bismuth. The action of the sprinkler, when a fire occurs within its vicinity, is as follows:—As soon as the heat engendered attains 150 or 155 degrees Fah. the solder is melted, and the tendency of the swing levers F and H is, without any force beyond that of their own gravity, to fall. But this tendency is at once assisted by the pressure of the water in the stem A acting upon the valve B, and in its turn upon the curved lever C. A slight change in the position of swing lever F is sufficient to release from its position the curved lever C, which at once falls away; this is followed by the loose seat before described, and with it the valve B, the stem of which drops into and closes the hole in the diaphragm below. This admits the water hitherto retained in A into the water chamber marked G, which strikes on the said diaphragm and escapes through perforations in the top of the chamber, and takes the form of a shower in its descent to the ground. To prevent the ingress of dust and other foreign matter when not in action, the perforations in the upper part of the chamber are covered by a thin collar of gun metal, which rises easily upon a discharge of water, and is indented upon its edges so as to assist in giving to the water the form of a shower. The loose seat, it will be observed, partly passes through the fixed diaphragm, but the perforation in the diaphragm is so large that it is impossible for the seat to become fixed in it when the lever C is released from its position, and, therefore, there is no danger whatever of the apparatus failing to act at the critical moment on that account. It has been asserted that sprinklers ought not to have swing levers or yokes, as they have been variously called. The force of such an objection depends entirely upon the form of those parts and how they are attached. No objection against Witter's Sprinkler will be made on that account, for neither the form nor the method of attachment admit of any exception. It will be apparent from the foregoing description of the "Witter" Sprinkler and its action, that the inventor has very carefully kept in view the teachings of experience, and has imparted to his invention in a highly successful degree the qualities which his experience has shewn sprinklers ought to possess. One of the prominent features is the way in which the two levers are combined, and the great resistance which the soldered joint enables the compound levers to maintain against the water pressure upon the valve B. To an engineer, however, it is apparent that the joint is placed in such a position as to be well able to withstand that strain, even if constant. The guarantee that is given with each "Witter" Sprinkler that it is tested to 300 lbs., when made, is quite sufficient on that score. However, a varying pressure, even when the maximum is less than 100 lbs. to the square inch, acts more adversely to the apparatus in the long run than when the maximum pressure is constant. But, in order that the soldered joint may be depended upon to keep in place the different parts of the sprinkler under such circumstances, it has been subjected, for a period of three months, to a pressure which fluctuated very frequently in the course of the day, and at the end of that time has been found to be, in every respect, good and sound. Another feature which is deserving of attention is the set screw marked E, a slight turn of which to the left will indicate, by water escaping, whether the apparatus is in working order and the installation pipes charged with water. Reference may now be made to some test experiments recently made at Messrs. Robinson's, Deptford Bridge, London. The conditions were unfavourable for the experiment, but the way in which it was performed left no doubt in the minds of the spectators that Mr. Witter's claims for the sprinkler were quite justified. An outbuilding, 21 feet long by 16 feet wide, was fitted with two sprinklers, placed 10 feet apart, and at a height of 10 feet from the floor. Lighted shavings underneath, within 10 seconds, created sufficient heat to melt the solder on the apparatus, immediately following which was the liberation of the water and the extinction of the flames. In this case, the flame was immediately under the sprinkler. In another test, the flame was created 8 feet from the point underneath the sprinkler, and, although much of the heat escaped through crevices in the eaves of the roof, the water was liberated in the space of about 60 seconds, and the fire speedily extinguished. There is also an "Alarm apparatus in connection with automatic sprinklers," patented by him, and now coming into use, but notice of this in these columns must be deferred until a future occasion.

Dyeing and Colouring.

Blue with Alizarine Bottom.—A bottom of an alizarine violet, made from an iron mordant, with another mordant, can be covered with alizarine blue, aniline blue or indigo. An alizarine violet thus produced gives life to indigo, particularly if a little alizarine blue or aniline blue is used. The shades are very fast and cheap. If alizarine blue is used, the mordanted fibre can be dyed with the alizarine blue and with alizarine in the same bath. Alizarine dyes iron mordants in the cold, but the blue takes only upon warming; therefore, the blue can always be placed on the top, even when the two substances are used in one bath.

Fast Dark Green on Cotton.—For 25lbs. of cotton, the goods are mordanted cold with 25lbs. of nitrate of iron, and then well washed; they are next prepared with tannic acid and antimony in the usual way. The dye-bath is composed of 7½lbs. of good soap, 2½lbs. of methylene blue B, and 1½lb. of auramine O. These materials are got into solution and the dyeing is commenced cold, the liquor is then gradually heated up to near the boiling point, but not to actual boil. The goods are again washed, whizzed, and again dyed at a temperature of 170°, in 20lbs. of prepared catechu liquor and 2½lbs. of sulphate of copper; a second bath, also at 170° F., contains 5lbs. of bichromate of potash; the goods, after the catechu, are passed into the chrome as in dyeing brown. After washing, the goods may be softened in a soap or oil emulsion bath, and finally dried.

Acetic Acid.—Acetic acid, which is directed to be used in dyeing woollen goods with alizarine green, alizarine orange, and ceruleine, should not be put in the bath at the commencement, nor all at once. When the temperature has reached about 160° F., it should be added by degrees in small quantities at a time, otherwise the colour does not come up even and regular. The quantity of acetic acid in the receipts is only 1½ per thousand of water; in some cases only 1 per thousand.—*Farber Zeitung.*

GARNETS UPON WOOL.—The term garnet is very comprehensive; usually it means a dull red. Garnets are made in different ways:—with archil substitutes and rocceline is one way. In this case, the colours should be dissolved separately; mordanted with sulphate of soda and sulphuric acid, entered lukewarm and brought to a boil in three-quarters of an hour. Garnets can also be made with amaranth and orange, mordanted as above. We advise introducing the orange in small portions to give an even shade. Where less fastness is required, acid magenta and orange can be used. We prefer, in this case, to replace the orange by chrysoidine. If the garnets thus obtained are not sufficiently dark, sulphate of indigo, or acid green, or violet, can be added to the dye-bath; in this last case, the bath must be coolled down with water, for, in a boiling bath, this colour goes on too quickly.—*Le Teinturier Practique.*

PROCESS FOR MORDANTING AND DYEING COTTON.—The following vacuum process is proposed by *Jagenburg*:—Instead of boiling the cotton for some hours in the mordanting or dyeing bath, which destroys the elasticity and suppleness of the fibres, the cotton is impregnated with the same solutions cold, or at a moderate temperature, by the use of a vacuum. If, for example, anilines are to be used, the cotton is first impregnated with a tannin solution or one of cutch, or some material containing tannin in a vacuum apparatus. Then, after extracting, it is treated in a second apparatus, identical with the first, containing an antimony solution or a copper solution. The cotton is then extracted a second time, placed in the dye-bath for some hours and washed. The vacuum apparatus offers no peculiarities, except that it is mounted on trunions to aid in filling and emptying.

THE MIKADO ORANGE AND MIKADO BROWN have lately been introduced upon the market. Both these colours dye cotton without a mordant; salt, or sulphate of soda, to the extent of 25 per cent must be added to the dye-bath. The first gives a fine orange which can be made redder by adding alkali to the bath. In an acid bath it gives a brownish shade upon cotton. It can be used for printing. It also colours silk in a bath containing a small quantity of acetic acid. The brown requires more of the salt in the dye-bath, even as much as equal weights can be used to advantage. The colour resists the light and soaping. It dyes more easily and with greater brilliancy after the addition of a little acetic acid. 4 per cent. of colour should be used.

POLYCHROME is a yellow colouring matter equally applicable to silk, wool, and cotton; it is, therefore, suitable for mixed goods. It is dyed as follows:—The colouring matter is dissolved in a small quantity of boiling water and is added to the bath with common salt. For 100 lbs, of cotton, a first bath must be made up as follows:—Common salt, 20 lbs., and colour, 5 lbs.; dye at a boil for 30 minutes, wash and enter cold into a second bath, made of nitrite of soda, 5 to 7 ozs. to the gallon of water, and sulphuric acid, 15 to 18 ozs. to the gallon of water. Add the sulphuric acid little by little. Enter the cotton and let it remain in this bath for 15 minutes, working constantly. Wash the cotton and then pass it into the developing bath. For this bath use the original dye-bath and add to it, dissolved in warm water, 1 per cent. of the developer and ½ of 1 per cent. of caustic soda. Enter the cotton below 105° F., work for 1 hour, rinse and wash. The colour should be developed as soon as it is dyed. The polychrome is like primuline in so far as it is made into a diazo compound upon the fibre by the action of the nitrite of soda, and it can be made to pass over into orange or red by a developing bath. Such a bath will consist of 5 per cent. of resorcine for an orange, or naphtol for a red; the colour is developed rapidly. This method of dyeing must be done with great care, but it gives shades which are fast to washing and soaping.

NAPHTOL BLACK is used upon wool. For a bluish black use the following receipt:—Naphtol black B, 8 per cent.; glaubers salt, 20 per cent.; bisulphate of soda, 15 per cent.; sulphuric acid, 5 per cent. For a dull black use 10 per cent. of naphtol black and 1 per cent. of tartrazine, or 2 per cent. of naphtol green. Tartrazine replaces advantageously fustic when a dye-bath is strongly acid.—*Industrie Textile.*

MAROONS are the colours composed of the three primary colours—yellow, red, and blue. They may be dark or light, more or less yellow, reddish, or bluish, and the typical shade is the chestnut, a reddish brown

BRONZES are the greenish brown shades which appear like an old bronze, of which the surface is covered with verdigris.

OLIVES are the dull green shades, generally not dark, which look more or less like an olive. The number of shades which can be produced by a mixture of yellow, red, and blue is considerable. There exists also a number of poorly defined shades of maroon, bronze, and olive. The numerous methods used for dyeing wool in maroon, bronze, or olive, can be divided into two classes:—(1). Those which require two baths, usually a mordant bath and a dye-bath:—

Maroons with logwood and archil.	Maroons with redwood.
,, ,, ,, ,, redwood.	,, ,, sanderswood.
,, ,, fustic ,, ,,	,, ,, archil and indigo.
,, ,, logwood ,, sanderswood	Olives with fustic and indigo.
,, ,, archil ,, fustic.	,, ,, ,,
Olives with sumach, indigo, and fustic.	Maroons with woad and madder.
Maroons with redwood and woad.	,, ,, ,, ,, cochineal
,, ,, cochineal ,, fustic.	Olives with ceruleine. [orange.
Bronzes ,, ceruleine ,, alizarine.	Yellowish maroons with alizarine

(2). Those which require only one bath and are one-dip colours:—

Maroons with indigo and archil.	Maroon with aniline maroon.
Bronzes ,, ,, ,, ,,	,, ,, ,, ,,
All shades with fast red and indigo.	,, ,, vesuvines.
,, ,, fuchsine S. and indigo	,, ,, maroon pastes.
Maroons with acid browns.	,, ,, aniline browns.
Brown maroons with sanderswood.	Yellow maroon with red-wood and madder.
,, ,, ,, redwood and fustic	Yellow maroon with fustic.

Maroons, bronzes, and olives are not delicate colours and, after scouring, the goods should be given a carbonate of soda bath and then rinsed in warm water. If the shades are to stand, the goods should leave the dye-bath a little yellower and slightly less red than the samples to be matched, as the yellow fades upon washing, and the red deepens in drying and finishing. Maroons, bronzes, and olives are all obtained in the same manner, the respective proportions of yellow, red, and blue alone vary, so that the same dye-bath can be used for one or another of these colours by varying the amount of the different dye-stuffs which it contains at any given time.—*Moyret.*

ANTIMONY SALT.—Dr. Lange, writing upon Haen's antimony salt, as compared with tartar emetic, for fixing colours, gives preference, on the whole, to the former. He says that white cloth, prepared with the fluorine salt and tannin, has a brighter, clearer, appearance than that prepared with tartar emetic, and dyes up livelier shades. Taking tartar emetic preparation as a standard, the antimony salt shows the following differences with certain dyes:—magenta dyes somewhat brighter, but not much different; methyl violet gives a somewhat redder shade; methylene blue is rather darker and redder; saffranine is a little more blue; auramine is darker and vesuvien is brighter; water blue is darker and redder with emetic than with Haen's salt, and brilliant green is more yellow. These trials were made upon cotton tanned with 4½ p. c. tannic acid, one portion fixed in emetic at a strength of 1½ lb. per 100 gallons of water, and the other on Haen's salt with ten per cent. less weight, the amount of metallic antimony being thus brought equal in both cases.

Bradford Trade with the United States.

ANOTHER LARGE INCREASE.

The statement showing the value of declared exports from the Consular district of Bradford to the United States during the month of February, 1889, has been prepared by Mr. W. F. Grinnell, United States Consul at Bradford. The corresponding month of 1888 is also exhibited for comparison:—

ARTICLES.	Feb. 1889.	Feb 1888.	Increase.	Decrease.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Stuffs	139,255 10 10	108,865 4 2	30,390 6 8	.. ..
Worsted Coatings	108,697 11 2	67,235 8 6	41,462 2 8	.. ..
Waste (Worsted)	47,020 17 11	3,979 2 2	43,041 15 9	.. ..
Wool	24,510 14 8	24,278 3 10	232 10 10	.. ..
Silk, Seals, Plushes, &c	22,377 16 11	33,889 19 7	.. ..	11,512 2 8
Worsted Yarns	16,733 11 7	20,655 8 7	.. ..	3,921 17 0
Mohair Yarns	2,592 19 7	2,343 11 5	249 8 2	.. ..
Other Yarns	2,159 14 2	2,195 14 5	.. ..	36 0 3
Carpets and Rugs	7,714 16 0	12,335 9 8	.. ..	4,620 13 8
Cotton Goods	6,792 1 3	8,903 13 11	.. ..	2,111 12 8
Machinery	6,016 17 2	3,197 19 10	2,818 17 4	.. ..
Camel's Hair Tops	4,140 5 2	3,643 15 4	496 9 10	.. ..
Iron, Steel, &c	3,014 13 11	2,333 9 6	681 4 5	.. ..
Woollen Goods	2,120 3 4	7,647 5 0	.. ..	5,527 1 8
Card Clothing	1,013 18 10	1,750 18 2	.. ..	736 19 4
Mohair Goat's Hair	863 13 2	324 0 0	539 13 2	.. ..
Noils	803 12 9	425 17 10	377 14 11	.. ..
Silk Waste	746 14 5	148 6 6	598 7 11	.. ..
Grease, &c	518 1 6	4,251 6 5	.. ..	733 4 11
Leather	314 3 11	534 4 8	.. ..	220 0 9
Tapestry, Damasks, &c	229 14 11	517 4 4	.. ..	287 9 5
Hair Cloths	239 17 1	263 12 4	.. ..	23 15 3
Shawls, &c.	238 0 0	44 3 9	193 16 3	.. ..
Chemicals	133 15 11	79 10 10	54 5 1	.. ..
Paper	45 3 0	.. ..	45 3 0	.. ..
Tape, Braid, &c.	39 2 0	122 2 10	.. ..	83 0 10
Buttons	32 19 9	.. ..	32 19 9	.. ..
Miscellaneous	24 6 8	72 9 3	.. ..	48 2 7
Hemp Bagging	17 17 11	24 5 5	.. ..	6 7 6
Cow and Calf Hair	.. ..	456 4 4	.. ..	456 4 4
Elastic Web	.. ..	11 3 5	.. ..	11 3 5
TOTALS	398,408 15 6	307,529 16 0	121,214 15 9	30,335 16 3

Increase - £90,978 19 6

A "Gold Medal" has been awarded at the Melbourne Exhibition to Messrs. T. Broadbent and Co., Central Iron Works, Huddersfield, for the excellence of their Patent Suspended Steam Driven Hydro-Extractors, a number of which they sent to Melbourne.

ORIGINAL DESIGNS.

On our first plate, we give a design intended for a Lace Curtain with dado. This shows half the width of the curtain. It has been drawn by Mr. R. Lord, 10, Ann Place, Bradford. In a design of this character, many suggestions may be taken for other fabrics. There is the body pattern which has an all-over floral effect. Then there are various floral borders and ornamental corners, all of which will be found useful for other purposes than the one mentioned.

* * * * *

Our second plate has various figures descriptive of an article on another page, on Weaving Diagonal Cloths.

* * * * *

On our third plate is a design for a Printed Blind, which will serve also for Printed Muslin. This has been designed by Mr. R. Lord.

MONTHLY TRADE REPORTS.

WOOL.—The trade in the wool and worsted districts has presented no new features during the month. The raw material has only been sold in sufficient quantities to have sufficed for actual consumption, there having been a marked absence of any speculation. The yarn trade has been a shade quieter, with a slight decline in prices, this being in a measure due to the fact that orders generally have run out, and spinners, in order to secure contracts, have taken slightly reduced rates. The piece branches have kept fairly busy, the largely increased varieties of cloths being produced acting beneficially on this trade. Prices for most descriptions have kept firm.

COTTON.—The demand for the raw material has been about an average one for most descriptions, and, with slightly fluctuating prices during the month; the close saw a rather hardening tendency in rates. The trade in yarns has been fair, but buyers have tried hard to reduce prices, yet without much success, as spinners have held firmly to their demands, even where extensive contracts have been offered. In the cloth branches, a moderate business has been done, and, in many cases, it has been with difficulty that producers have succeeded in keeping up prices, whilst, in others, lower rates have been accepted for good orders, the position in which the manufacturer is placed generally determining this.

WOOLLEN.—In the woollen districts, there has been a very cheerful feeling; with some slight exceptions, full time is the rule, and orders are fairly large. Manufacturers are busy making up patterns for the spring season of 1890, and, judging by reports, the fabrics that will then be in vogue are more effective than formerly. The present demand is good for the best class of plain and fancy worsteds, and also for good tweeds, Cheviots, and low qualities for the clothing trade. With few exceptions, the colourings are brighter than for recent seasons, and the tendency seems to be more and more for good designs and colourings. In another column will be found particulars of the fabrics likely to have a run in spring, 1890.

LINEN.—There has been a marked improvement in the linen trade during the past month, nearly all departments partaking of an increased demand. Domestic cloths have been much inquired for, and especially has this been the case for the medium and lower kinds. Drills, sheeting, and drabbets have also received more attention than for some time past, and, generally, manufacturers are very hopeful of an improved trade, at any rate, for some little time. There are still complaints of low prices, but these have slightly improved during the month.

LACE.—There has been a rather improved tone in some branches of the lace trade. Curtains and window blind nets have had a more than average request, and the same may be said of bobbin nets of the coarser qualities. Millinery laces and silk veil nets have been in improved demand, as have also Torchon and such like laces. There is a more hopeful feeling as to the various branches of the lace trade than has existed for some time past, and the prospects for the immediate future are held to be cheering. Anything of a novel character is eagerly bought up. Prices have improved to a slight extent.

A member of the Paris house of Rothschild, who was recently in Central Asia, has petitioned the Russian Government for permission to lease some 80,000 acres for growing cotton, and for the erection of manufactories, with a view to supplying the Central Asian market.

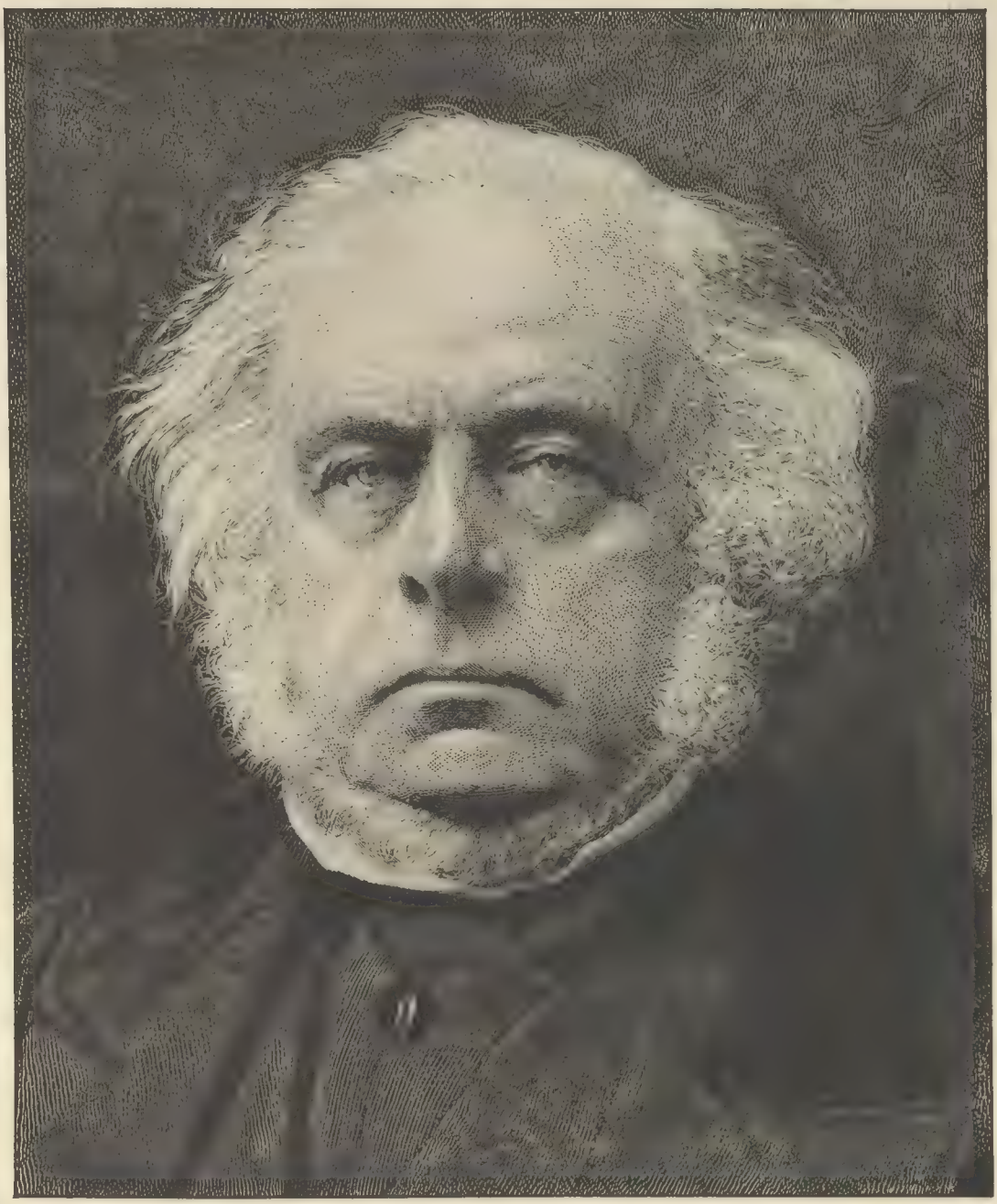
The Loom—Its History, Use, and Construction.

The members of the Manchester Association of Engineers held their fortnightly meeting at the Grand Hotel, Aytoun Street, Manchester. Mr. Samuel Dixon, the president of the society, took the chair. Mr. C. P. Brooks, M.S.A., of Stalybridge, read a paper on the above subject. He said that the loom took a high position in the machinery employed in the industries of England. In 1885, there were 773,705 looms working in the United Kingdom, 560,995 of which were engaged in the cotton trade; while, during the present year, 450,000, or nearly three-fourths of the cotton looms in the United Kingdom, were working within a radius of 34 miles from Manchester. He explained the methods of working the loom, and detailed the old arrangement under which they were used. He described the loom worked by the Hindoos before the introduction of machinery, and drew attention to the interesting similarity that the ancient contrivances bore to the handlooms of England until recent years. The Rev. E. Cartwright was the inventor of the power-loom, and the first to enunciate the three principles of weaving, shedding, picking, and beating up, and constructed his loom to work on the lines of this principle. As you may infer from his calling, the first efforts of this inventor were somewhat crude. However, later attempts were more successful, and on August 1st, 1787, his last patent was taken out for a machine in which he employed a spring picking motion, a batten or slay, weft and warp stop motions, let-off and take-up motions. This loom was crude and incomplete, and yet on it is founded the whole of our textile manufactures. In 1791, these looms were applied by Messrs. Johnston, of Gorton, who erected a factory at Knott Mills, intending to fix 400 looms. When 25 had been put in, the shed was burned down by incendiaries. Then Miller, a printworks manager in Scotland, invented the wiper loom, and patented it in 1796. Here the movement of the slay was caused by a wiper or cam pressing it away from the edge of the cloth, and an arrangement of springs pulling it back. The picking stick, a single one, fixed in the middle of the loom, was also actuated by a wiper or cam, and simply did the same work as the hand of the weaver in Kay's fly shuttle loom, *i.e.*, pulled the shuttle out of each box alternately. Horrocks, of Stockport, made substantial improvements on Cartwright's and Miller's looms, and, in 1803, patented a machine the same in principle, and, to a certain extent, in construction as now. The manufacture of his loom was taken up by Messrs. Sharp and Roberts, machinists, of Manchester, who were probably the earliest loom makers on a large scale. With regard to the greater producing power of looms, he observed that they were running in 1830 at 120 picks per minute. Now, an average width of loom was run at 200 picks per minute; while, in 1823, a steam loom weaver, according to Edward Baines, attended to two looms, at the present time a weaver minded four. In his opinion, the first point that required attention in loom making, with a view to greater perfection in the machine, was additional speed, a difficult thing to attain. To gain this object, the loom must be improved in its working parts so as to give less vibration, and manipulate the threads more tenderly. That, in a measure, would have to be attained by the planing of joints of the framework, hardening the working parts, and by other means. The further simplification of the loom was a thing to be desired. The fancy branch of cotton weaving seemed to be developing, and he had no doubt that there was a field opening in which cheap, effective, and simple machinery for fabricating the ornamental cotton cloths would have great success. Mr. Brooks illustrated his remarks by a number of interesting figures and drawings, and he received a cordial vote of thanks for his paper. The paper, we understand, will shortly be issued in book form with the diagrams.

Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of failures in England and Wales gazetted during the four weeks ending Saturday, Feb. 23rd, was 370. The number in the corresponding four weeks of last year was 424, showing a decrease of 54. In addition to these gazetted failures, there were 292 Deeds of Arrangement filed at the Bills of Sale Office during the same four weeks. The number filed in the corresponding four weeks of last year was 268, showing an increase of 24. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, Feb. 23rd, was 937. The number in the corresponding four weeks of last year was 1017, showing a decrease of 80. The number published in Ireland for the same four weeks was 45. The number in the corresponding four weeks of last year was 35, showing an increase of 10.

London *Industries* says that the cement by which many stone buildings in Paris have been renovated is likely to prove useful in repairing the foundations for machinery. The powder which forms the basis of cement is composed of two parts oxide of zinc, two of crushed hard limestone, and one of pulverized grit, together with a certain proportion of ochre as a colouring agent. The liquid with which this powder is to be mixed consists of a saturated solution of six parts of zinc in commercial muriatic acid, to which is added one part of sal-ammoniac; this solution is diluted with two-thirds of its volume of water. A mixture of one pound of the powder to two and one-half pints of the liquid forms a cement which hardens quickly and is of great strength.



The Late Right Hon. John Bright.

BORDER FOR DRESS GOODS.

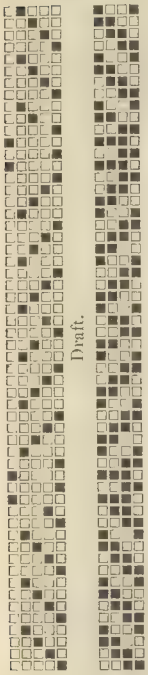
12TH APRIL, 1889.

DESIGNED BY R. T. LORD.

CRETONNE.

FASHIONABLE DESIGNS.

Worsted Trousering or Costume Cloths.



No. 569.

Design.

Warp :—1 end Red, 2/48's worsted.
2 ends Black, ,, ,,
10 ,, White, ,, ,,
1 end Black, ,, ,,
2 ends Silk as 1 100/2 ,,
1 end Black, 2/48's worsted.
2 ends Silk as 1 100/2 ,,
11 ,, White, 2/48's ,,

28 ends in pattern.

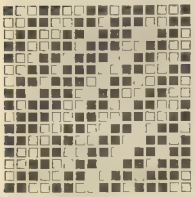
Weft :—40's Dark Blue worsted.

2,016 ends in warp ; 56 ends per inch ; 14's reed, 4 ends in a reed ; 60 picks per inch ; 36 inches wide in loom ; 32 inches wide when finished.

Weight 4 ozs. per yard.

Woollen Suiting.

No. 570.



Design.

Warp :—
1 end Brown and White twist, 9 skeins.
2 ends White, 18 ,,
1 end Brown and Black twist, 12 ,,
11 ends White, 18 ,,
1 end Blue, 12 ,,
10 ends White, 18 ,,

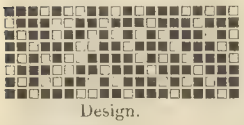
26 ends in pattern.

Weft :—13 skeins woollen, all Black.

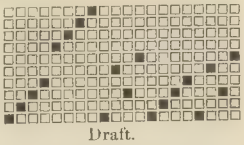
2,080 ends in warp ; 32 ends per inch ; 8's reed, 4 ends in a reed ; 36 picks per inch ; 64 inches wide in loom ; 56 inches wide when finished. Weight 18¼ ozs.

Serge Suitings.

No. 571.



Design.



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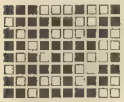
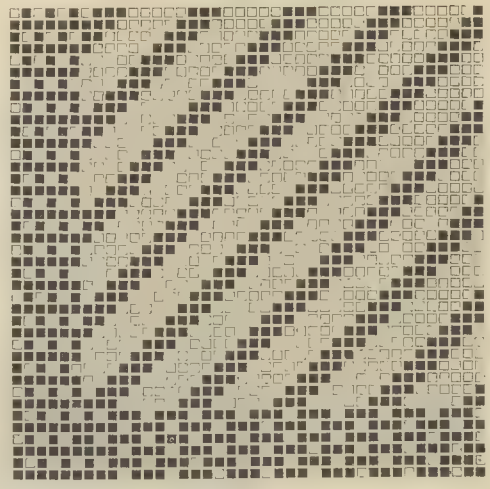


Pegging plan.

Warp :—2/16's worsted, Black and Blue twist.
Weft :—28 picks, Black, 2/18's worsted.
4 ,, Dark Blue, ,,

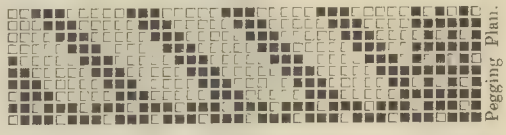
2,112 ends in warp ; 33 ends per inch ; 8½ reed, 4 ends in a reed ; 46 picks per inch ; 64 inches wide in loom ; 56 inches wide when finished. Weight 17 ozs. per yard.

No. 572.



Design.

Draft.



Warp :—2/18's Indigo worsted. Weft :—8's Indigo worsted.

3,584 ends in warp ; 56 ends per inch ; 14's reed, 4 ends in a reed ; 46 picks per inch ; 64 inches wide in the loom ; 56 inches wide when finished. Weight 20¼ ozs. per yard,

New Fibres.

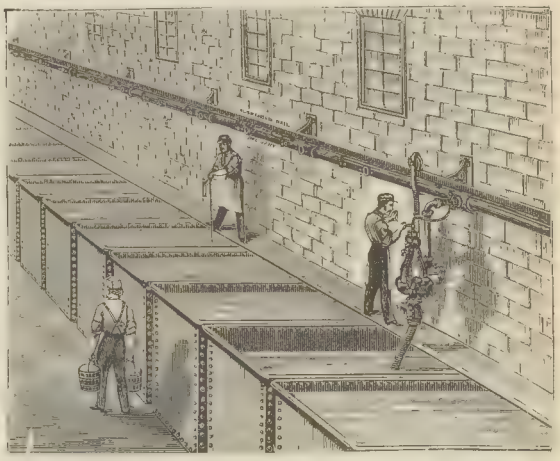
Botanical specimens, as well as a specimen of fibre, were recently received at Kew through the Colonial Office, from the Governor of Lagos. These specimens have proved interesting as bringing under notice, apparently for the first time, a valuable fibre-plant on the West Coast of Africa. The plant has been determined as *Honokenya ficifolia*, Willd., and it is known in Lagos as "Bolobolo," or "Agbowrin ilassa." Messrs. Ide and Christie, of 72, Mark Lane, London, who were asked to give their opinion upon the value of the fibre commercially, have replied to Mr. D. Morris, the Assistant Director of Kew, that they consider the Bolobolo fibre a very valuable one of the jute class—distinctly superior to jute in many respects, and more particularly in strength. It was of good length and well cleaned, and they were of opinion that, if the fibre could be produced in large quantities, there is a very wide field open to it at a higher price than jute, and that it would probably never fetch less than £12 per ton. From Russia, a report comes that a new fibre plant has been discovered on the shores of the Caspian Sea—called Kanaff by the natives—which grows in the summer, and attains a height of 10 ft., with a diameter varying from two to three centimetres. A soft, elastic, and silky fibre has been produced from this, making a very tough thread, and which, it is said, can be chemically bleached without losing its value, whilst, when made up into stuffs, it can be dyed in every shade of colour. For sacks, tarpaulin, ropes, &c., it is thought this fibre would defy all competition, as its specific weight is much less, and its resistance much greater, than that of hemp. A cord of Kanaff, manufactured at Moscow, half an inch thick, stood a breaking test up to 625 kilogs.

MACHINERY, &c.

The Pulsometer Pump.

The Pulsometer Pump was introduced to the public some years ago, since which time it has been very largely used for a variety of purposes, and has always proved itself a valuable acquisition in every branch of industry. It is not our intention to enter into a long description of the mechanism of the pump, but only of its action, which will be interesting to users of this class of machinery. The steam valve being opened, the steam passes into that chamber which is not closed by the ball valve at the apex of the pump, and gently depresses the water without agitation, forcing it through the discharge valve and into the delivery pipe. The moment that the water uncovers the opening leading into the discharge chamber, the steam passes underneath the water and is suddenly condensed, forming a vacuum which draws the ball valve over, thus shutting off the steam from one chamber and allowing it to pass into the other. The vacuum, at the same time, opens the suction valve, and draws the chamber full of water from the suction pipe, meanwhile, the steam is emptying the other side of the pump; and so the action goes on, surely and regularly, without intermission, as long as steam is supplied, and there is water to be pumped. We will now make reference to some of its distinguishing features, and to the many useful and various purposes for which it may be employed. The pump itself can never be worn out; the only wearing parts (the valves) can be readily and cheaply renewed; such renewals are needed only at long intervals; there is no expense for skilled labour, whilst on uniform work the pump may be left acting for weeks without anyone going near it; neither oil, tallow, packing, nor leathers are required; it will work equally as well suspended on a chain as when fixed, and can be used whilst being lowered; for sinking work, the great advantage of this capability will be readily recognised; semi-liquids and gritty substances, such as mud, liquid cement, slurry, and sewage sludge are pumped, without detriment to the pulsometer; the cost of fixing for permanent work is trifling, and no foundation is required; it will go into a very small space; having no exhaust steam, it can be used in confined spaces without heating them up, as is the case with many steam pumps; there being no frictional parts, the pulsometer is more reliable than many steam pumps, as it will start at once, even if it has been idle for a long period; it is noiseless (except for some kinds of valves for very special work), the just audible click of the steam ball indicating the speed at which the pump is working. These may be briefly stated as its distinguishing features. We have stated that the pulsometer will work just as well suspended from a chain or rope, as if it were permanently fixed, its very small size in proportion to the quantity of water thrown making it available in a great variety of situations where other pumps cannot possibly be applied, and it is confidently recommended as certain to give satisfaction in the most awkward positions and for the most trying work. The experience of the makers in this way has been large and most conclusive. Should a sudden influx of water occur in any sinking operation and the pulsometer be drowned out, it can be at once drawn up to the top and set to work again without delay. If, under similar circumstances, any ordinary pump were employed, it would probably be almost impossible to start or recover it, and an additional pump would probably be necessary before the work could proceed. It is a far easier thing to hang up a pulsometer by a chain down an excavation, or in a well, with one length of rising main attached, and a flexible steam hose, than to sling any of the forms of direct-acting pumps on its platform, especially as in the latter case the exhaust steam has to be provided for, whilst the pulsometer disposes of its own. The shaft is, therefore, kept cool, and does not inconvenience the workmen. A special feature is that the pulsometer will, where the conditions remain constant, work day and night without attendance—in fact, as long as steam and water are supplied to it. It will pump water, and a great variety of other liquids and semi-liquids, to a total of from 60 to 80 feet. It will pump many chemical liquids, especially those which, by their tendency to crystallize, give endless trouble, where piston or centrifugal pumps are used, such, for instance, as sulphate and carbonate of soda. The advantage obtained by the absence of wearing parts in raising this class of liquids will be appreciated by chemical manufacturers. For these purposes, the material of which the pump is made is selected with due regard to the nature of the liquid to be raised. We give two illustrations. One of these shows the pulsometer as used for excavating foundations and general purposes, and the other shows an arrangement for emptying vats and distributing liquors in chemical works, dyeworks, bleachworks, &c. In the latter, the pulsometer will be noticed suspended on a rail which traverses the building. Therefore, the pump is readily moved for operation at any desired position. The illustrations serve to show the ease with which the pump may be applied to special purposes, and there are many of these which the pulsometer will fulfil with facility. For instance, it is specially suitable for contractor's work generally, such as well sinking, quarry work, draining of deep trenches, &c., as well as for draining underground workings in collieries, mines, &c. It is also used in connection with feeding tanks for locomotives, and for emptying docks and supplying water to swimming baths. It is made to be used in connection with vertical boilers, and also with a boiler on road wheels. Therefore, it can be applied for purposes which, under other conditions, would be impossible. Another form is that by which the pulsometer is mounted upon wheels, making it specially applicable for fire extinguishing purposes. But it is for factory purposes generally to which we wish to direct particular attention to the pulsometer pump. Large numbers of them are in use in factories of all descriptions, on account of their simplicity and durability, the ease with which they can be fixed in any required position, and from the fact that they are not injured by standing idle. A form of pulsometer is made called the Hydrotrophe, which is constructed as a boiler feeder. We desire to draw special attention to this, as, when not required for boiler feeding, it can be applied to other purposes. Illustrated catalogues may be had giving full particulars and descriptions, together with prices, and our readers should write for these to the makers, The Pulsometer Engineering Company, Limited, Nine Elms Ironworks, London, S.W.

The Pulsometer Pump for excavating and general purposes.



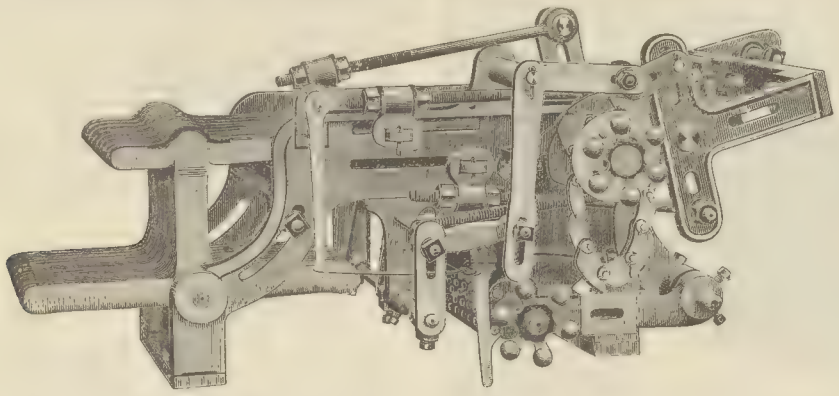
The Pulsometer Pump for Chemical Works, Dye Works, Bleach Works, &c

Prevention of Condensation in Steam Cylinders.

The method hitherto employed for preventing condensation in steam cylinders is by jacketing the cylinder, either with some non-conducting material or with live steam. Mr. Bryan Donkin, junr., has, however, made a new departure in heating cylinders, which promises to give good results, if we may judge by the preliminary experiments tried at the works of Messrs. Bryan Donkin and Co., Bermondsey, London, S.E. The apparatus employed consists of a series of Bunsen burners, placed at intervals round the steam cylinder, the gas jets heating the cylinder walls up to a temperature equal to, or exceeding, that of the entering steam. The steam on entering is, therefore, not chilled, and the expansion curve is raised. One feature in this invention is the thorough command which can be obtained over the temperature of the cylinder. Few or many burners can be employed, and the gas flames can be raised or lowered, to any degree, to suit what is found to be the most economical temperature to work with. Of course, against the saving due to absence of condensed water in the cylinder must be placed the cost of the gas consumed in heating the metal of the cylinder. We have not been furnished with figures, but we are informed that the results obtained at present indicate a saving of 25 per cent. in the weight of fee water or steam used per indicated horse power.—*Industries.*

Improved Direct-Acting Dobby.

In the making of dobbies, there have been many improvements during the past few years, the tendency being to render them more efficient in working, to simplify the various parts, and at the same time to extend the possibility of producing improved patterns. A decided advance in this direction has recently been introduced by Mr. Parkinson, machinist, Chester Street, Bradford, who, being a thoroughly practical man, has seen the faults in the existing dobbies, and has perfected a mechanism by which complicated designs can be woven with a greatly reduced number of cards. This in itself will induce users of this class of apparatus to take more than ordinary interest in it, as, in the present days of competition, economy in any direction is now the first thought of a textile manufacturer. The annexed engraving shows one of "Poole's" positive double-acting dobbies, with Mr. Parkinson's improvements applied. It is fitted up with 16 shafts or draw-bars for actuating the healds, and two side ones for controlling the movement of the needles and cylinder respectively. The dobby is on the four-shaft principle, and has a square cylinder with four rows of holes on each side. The different sections of the pattern are set off on their respective row of holes in the usual manner. A lateral movement is given to the grate carrying the needles, so that they can be automatically brought to correct working relation with any desired row of holes in the cylinder. The motion for doing this consists of a bell crank and other levers suitably connected with the grate which carries the needles. The grate is controlled by an intermediate chain tappet motion fixed on the upper part of the dobby, which is governed by the outside draw-bar above referred to; so that, indirectly, a connection is made between the needles and the draw-bar, and again with the pattern card. The tappet chain consists of a series of peculiarly shaped links, varying in height according to the number of shifts the needles require to make. When it is desired to shift the needles over the holes in the cylinder alternately or consecutively, as the case may be, the links are placed in the chain accordingly. When it is intended that the needles should not shift at all, but remain operating upon the same row of holes, the hook or



Improved Direct-Acting Dobby.

catch which turns the chain wheel is lifted out of gear by a stud on one side of it, and the wheel consequently does not revolve. The revolving of the cylinder is also under the control of the pattern card, and can be arrested automatically as in the case of the needles, similar levers and catches being used for the purpose. The connection, however, is made direct instead of through a tappet chain. By the aid of these combinations and the setting of the link chain, it is possible to weave the borders and centres of handkerchiefs, towellings, and similar goods, by very few cards, and all the necessary changes are effected automatically. The up and down movement of the card cylinder has also received attention. By an improvement which Mr. Parkinson has made, he is enabled to use a smaller cylinder than usual, and correspondingly narrower cards. Hitherto, in dobbies of the kind illustrated, the cylinder moves in the arc of a circle, with the shaft that carries the crank arm as its centre. It is necessary, therefore, that the holes in the card cylinder should be sufficiently large to admit the needles when at the extreme ends of the arc. It will at once be seen that the greater the lift the larger will be the holes, necessitating wider cards and a correspondingly larger cylinder. To obviate this, Mr. Parkinson moves the cylinder in a perfectly vertical direction by guiding it between two vertical slots and upright rods. As a natural consequence, he is enabled to reduce the holes in the cylinder to a little more than the diameter of the needles, to place the rows closer together, to reduce the width of the card and the cylinder, and by so doing a less lift is required on account of the latter needing less space to revolve in, and a higher rate of speed is possible. The dobby, in addition to weaving a large variety of what may be termed ordinary fabrics, will prove of the utmost advantage in the production of figured goods, such as toilet cloths, handkerchiefs, &c., and to manufacturers of these classes of goods the apparatus especially commends itself. As a whole, the dobby is a very compact machine, has few working parts, and, in fixing, the labour entailed is reduced, when compared with that of the apparatus now in general use. Mr. Parkinson is to be congratulated upon producing such an efficient mechanism, and undoubtedly he will be repaid by its success.

Machine for Mordanting, Dyeing, Washing and Sizing Hanks of Yarn.

There is a variety of apparatus now in use for the above named purposes, the generally approved one consisting in having a series of rollers or fallers, on which the hanks to be dyed are placed, and to which a rotary motion is imparted for the purpose of drawing the hanks through the dye continuously or reversely. There are many drawbacks to this apparatus, complaints being constantly made about uneven dyeing; the fault resulting from the ends of the hanks not remaining straight, consequently, the dye, &c., do not work into the yarn evenly. To overcome these defects, Mr. S. Spencer, Engineer, Narrow Lane Works, Whitefield, Manchester, has, for some time been experimenting, and has produced an improved mechanism which causes the hanks of yarn to be intermittently drawn through, raised, lowered, and opened successively, and also provides that the ends of the hanks remain perfectly straight, and the mordant or dye is enabled to penetrate and strike the same more completely. The machine consists of a vat or cistern and, in place of the fallers or rollers, a convenient number of discs are secured, either alone or in conjunction with a wringing mechanism. Each of these discs is fixed on a short shaft carried by a bearing mounted on a frame or on the vat or cistern itself, and to this shaft is a worm wheel in gear with a worm fixed on the driving shaft of the machine. The disc is formed with a radial slot, into which is secured an adjustable rod or arm, and the end of the shaft to which the disc is fixed, or the disc itself, is formed with a concentric hole or socket to receive a bar, on which the hanks are generally placed. The rod or arm, at a right angle, extends from the disc to near the front of the cistern, and the bar is arranged parallel with it, and is carried by a hinged support to the front of the cistern, whereby the placing and removing of the hanks on and off the disc is facilitated. The mechanism is set to work as follows:—The hanks of yarn are fixed upon the bar, and the bar is then put upon the rod or arm, the ends of the bar being placed in concentric holes, on the disc or disc shaft and hinged support. By suitable means, rotary motion is imparted continuously and reversely to the disc, thus causing the rod or arm to revolve around the bar, which remains stationary. The rod, when revolving from its lowest to its highest position, lifts the hank and gives it a turn equal to the radius at which the rod is fixed on the disc, while, during the first and second quarters of its revolution, it opens and closes the hank respectively. On the rod completing its revolution, viz.:—revolving from its highest to its lowest position, the hank is lowered, opened, and closed respectively during the third and fourth quarters of the revolution. It will thus be understood that, although the rotation of the disc is continuous, the action on the hank, viz.:—its rotation, is intermittent, as the rod only imparts a turn to the same on its ascent. When the hanks are taken out of the dye vat, it is usual to lift them out, but, instead of doing this, Mr. Spencer has devised a mechanism for lowering the level of the dye, this is accomplished by having an inner vat or cistern, which can be raised or lowered as required. We may add that the machine is adapted for the mordanting, dyeing, sizing, &c., of any description of yarns, and that the speed or amount of turn to be imparted to varying counts of yarns, lengths of hanks, &c., can be regulated easily. The apparatus can be made double acting by employing two of the described rods or arms on the disc. The machine is worthy the attention of those engaged in these branches of industry, and particulars will be furnished by Mr. S. Spencer.

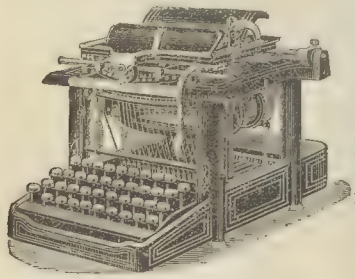
Improved Mechanism for Weaving Cut Pile Fabrics.

An invention recently patented relates to certain improvements in the weaving of that class of fabric where two pieces, one above the other, are woven at one and the same time, the pieces being severed in the usual way. It is well known that pieces produced in plain looms at present are liable to imperfections known in the trade as "pile marked," which is the result of the use of an imperfect tappet rendered necessary by the essential requisite of a fast selvage. The object of this invention is to produce a piece free

from "pile marks" and with a fast selvage in a plain loom. Hitherto, in order to produce a piece having such a selvage and without "pile marks," it has been necessary to use a box loom, which is not only more costly in the first instance, but has the daily disadvantage of lower speed as compared with a plain loom; another drawback to the use of a box loom for the production of pile fabrics is that it is a more complicated machine, and, therefore, more liable to get out of order than is that known as a plain loom. In order to accomplish this object, a plain loom is used and what is ordinarily known as a perfect tappet, that is to say, a tappet which weaves one pick in the top, and one in the bottom, piece alternately. Extra healds are also used for the outer part of the selvage, in order to make the same fast, these being actuated by special tappets worked from the low shaft of the loom, thus producing the outer part of the edge with the requisite strength, and the face of the piece free from "pile marks."

The Remington Standard Type Writer.

The type writer, which we illustrate below, is one which has gained a wide-spread success as a thoroughly efficient machine. Business men find the process of overcoming a large correspondence by means of the pen much too slow and tedious in these go-a-head times, and, therefore, mechanical aid has been resorted to. The type writer is not such a modern invention as some may imagine, although, for a thoroughly perfect machine, we are indebted to the inventors of the past few years. We learn that, as far back as 1714, a patent was granted in England to a Mr. Henry Mills for such a machine, the next patent being allowed in 1841. Many such mechanisms have been invented from that time to the present, amongst the foremost of which is the Remington, now illustrated. Although the machine may appear somewhat complicated, it is really simpler than one might imagine. We have had opportunities of examining it and testing its capabilities, and we find it most easily operated. Putting the paper to be written upon in position against the revolving cylinder, all that is required is to place the indicator opposite the desired figure in the scale shown in front of the machine, which corresponds with a second scale against the cylinder, the only difference being that the numbers on the outer scale commence from the left, whilst those on the inner begin from the right. The indicator determines any desired position for the address, or signature, of a letter, and enables the writing to be begun at any required part of the paper. The position of the keys will be seen from a reference to the illustration. The letters of the alphabet, and other characters necessary for business correspondence, are clearly indicated on the keys. These are not arranged in proper rotation, but are placed in such a manner as experience has shown can be most quickly manipulated. In front of the keys is a long strip or key. This gives the spacing required between each word. There are also keys which change small letters to capitals, and capitals to small, etc. But this can be done by an additional attachment worked by the knee of the operator. When the operator reaches the end of a line, a signal is given by a small bell, then, by a simple movement of a handle in front of the apparatus, a new line is commenced. The inner mechanism of the machine, to which special reference may be made, consists of what may be called type bars, upon the ends of which is the type. This is arranged in an oval, and, above, an inked ribbon is suspended. By striking any key, the type bar, with the corresponding letter upon it, comes in sharp contact with the ribbon, and the letter is imprinted upon the paper. The action is somewhat similar to that of a piano. The operator may sit in any required position, and may use any of, or all, the fingers of both hands, therefore, it will be seen that, with ordinary attention, one may become proficient in writing with it in a very short time; on this point, we speak from actual experience. The speed which operators may attain, of course, depends upon ability, but an average writer should be able to do, at least, double the work to that accomplished with the pen, whilst some have attained a speed varying from about 80 to 100 words per minute. Messrs Wyckoff, Seamens and Benedict, 100, Gracechurch Street, London, E.C., and 8, Moult Street, Cross Street, Manchester, are the sole manufacturers and proprietors of the Remington standard type writer. The sole dealer for the West of Yorkshire is Mr. R. W. Hickman-Riches, 10, Piccadilly, Bradford, who gave a very interesting lecture on the type writer in Leeds a few days ago.



Electric Light Installation at Messrs. Charles Semon and Co.'s, Bradford.

We had recently the pleasure of inspecting an electric light installation at the warehouse of Messrs. Charles Semon and Co., Bradford, the engineers for which were the Schmidt Douglas Electric Company, Limited, of Bradford, Manchester, and London. The installation consists of incandescent and arc lamps. We will take the various departments of the warehouse in the order in which we visited them, commencing with the basement, in which is the motive power, consisting of a 12½ h.p. high speed engine, made by Browitt and Lindley, Salford, driving a Schukart's dynamo. A noteworthy feature is the small space occupied by the engine and dynamo, the room in which they are placed being not more that 15ft. by 8ft. This is an advantage which should be considered where economy of space is desirable. From the basement we were conducted to the pattern room, where are two arc lights. Next in order came the offices in which there are forty 16-candle power Edison-Swan lamps. Still mounting higher to the worsted room, there are three Schmidt's improved Pilsen arc lamps, and higher again, in the making-up department, are two arc lamps, and in the fancy department one arc lamp is fixed. The most notable and beneficial result derived from the lamps in the departments mentioned is that work which, under any other conditions, must cease as daylight fades, can now be prolonged to any hour. Thus, the passing of pieces, work which requires the clearest daylight in order to detect flaws in the weaving or defects in the colour, now goes on uninterruptedly. The same remarks also apply to the matching of patterns and colours in the fancy department. In fact, there is scarcely an end to the advantages derived from an electric light installation in a commercial house such as Messrs. Semon and Co.'s, and, therefore, it is unnecessary for us to enlarge upon this point. The engineers have performed their work in a highly efficient manner, and are to be congratulated upon having received from Messrs. Semon and Co. a letter expressing entire satisfaction with the installation after an experience of two years, and offering to show the light to anyone who may wish to see it. The whole of the lights in the various departments are extremely steady, not as much as a flicker being observable during the whole time we spent in examining them. This is all the more noticeable from the fact that the arc and incandescent lamps are worked from the same circuit, which, under some conditions, would result in unsteadiness of the light.

Improved Loom for Weaving Various Fabrics.

The object of this invention is to cause the weft thread, as it is thrown in the shed of a loom by the shuttle, to lie in an unstretched or loose condition, so that, when it is beaten up by the lathe, it will have little or no tension upon it, and, consequently, the fabric will be less liable to shrink than fabrics of ordinary manufacture. The invention consists essentially in causing the weft thread, while being thrown, to be held by needles, fingers, or hooks, at one or more points of the shuttle race, so that the thread, instead of lying in a straight line or in a stretched condition in the shed, lies in a more or less angular position, forming a broken line, the thread being released by the needles or fingers as soon as the shuttle has completed its course, so as to lie in a loose or unstretched condition as before stated, while it is beaten up by the lathe. The accompanying drawing shews arrange-

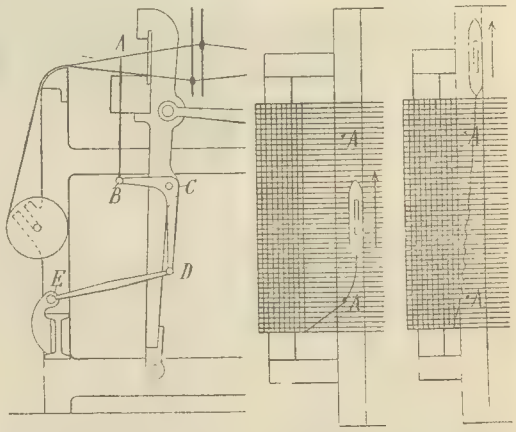


Fig. 1. *Fig.* 2. *Fig.* 3.

ments by which the above described invention may be carried into effect. In the arrangement shewn at Fig. 1, there are provided needles or fingers, AB, which pass through the shuttle race of the lathe, and which are projected up through the race as the shuttle is thrown, so that the thread becomes caught behind them, as shewn at Fig. 2, which gives the right motion of the shuttle, the thread being caught in the same manner when the shuttle is sent to the left. At the end of the shuttle's stroke, the needles are withdrawn, leaving the thread in a loose condition, as shewn at Fig. 3. The mode of actuating the needles or fingers for this purpose is shewn at Fig. 1. The lower end (B) of the needle is connected to a bell-crank lever B, C D, pivotted at C to the lathe, its arm (C D) being jointed to the rocking arm (E D), pivotted at E to some fixed part of the loom, but the mechanism can be varied to suit different requirements, and the needles or fingers may either be actuated by separate mechanisms or they may all be worked by one and the same mechanism.

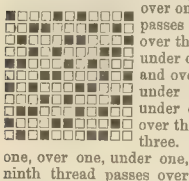
Papier-Maché Covering for Pulleys.

There are often complaints made of the loss of power from the continual slipping of belts on pulleys, a loss which can hardly be computed in some factories where means are not frequently taken in order to prevent, as much as possible, this source of annoyance and waste. Various expedients have been devised to counteract the evil, with more or less success, but in many cases, the constant loss, either from a want of knowledge or tact, is allowed to go on without any efforts being made to economise as much as possible the driving power of a pulley. In order to get over the difficulty and loss, Mr. W. S. Dougall, of Radcliffe-on Trent, Nottinghamshire, has patented a covering for pulleys which he guarantees will ensure a considerable gain of driving power under the most unfavourable circumstances. This covering is made of papier-maché, and is applied to the face of the pulley by means of a chemically prepared cement. So firmly does the covering adhere to the face that, after being in use a few hours, it becomes practically petrified, and is, in fact, an inseparable part of the pulley. The absence of any rivetting, as employed in some processes of covering, makes this invention of great value, as rivetting has a tendency to act in a detrimental manner upon the inner part of driving belts, whilst the comparative smoothness of the papier-maché covered pulley and the fact that oil, dust, and steam have little or no effect upon it, makes it nearly perfect for the purpose of driving. Pulleys can be covered with the material without being removed from the shafting, and after the operation are speedily put to work again. The cost of covering is very small when the actual saving in economy of power is taken into account. Mr. Dougall has already covered pulleys in large numbers for some of the leading firms in different parts of the country. Full particulars of cost, &c., can be had on application to the patentee.

New Patented Fabrics.

A recent patent has for its object the making of a fabric which shall have the appearance of a cashmere cloth, and also the fulness of a merino. It consists in the interweaving of the warp and weft threads as described below, and as represented in the accompanying plan. The first thread floats or passes (as shown in the accompanying drawing) over two, under one, over two, under one, over two, and under three. The second thread passes under one, over two, under one, over two, under three, and over two. The third thread passes over one, under one, over two, under three, over two, under one, and over one. The fourth thread passes over two, under three, over two, under one, over two, and under one. The fifth passes under three, over two, under one, over two, under one, and over two. The sixth thread passes under one, over two, under one, over two, under one, over two, and under two. The seventh thread passes over one, under one, over two, under one, over two, under three, and over one. The eighth thread passes over two, under one, over two, under three, over two, and under one. The ninth thread passes under one, over two, under three, over two, under one, and over two. The tenth thread passes over one, under three, over two, under one, over two, under one, and over one. The eleventh thread passes under two, over two, under one, over two, under one, over two, and under one.

The object of another invention is to produce a fabric, which, while apparently of a loose texture, shall not have the tendency to slip or fray, which is generally inherent in fabrics of such a nature. The first thread floats, or passes, as shewn in the accompanying drawing, over one, under one, over one, under one, over three, under two, and over two. The second thread passes under one, over three, under two, over three, under one, and over one. The third thread passes over one, under two, over three, under one, over one, under one, and over two. The fourth thread passes over three, under one, over one, under one, over three, and under two. The fifth thread passes under one, over one, under one, over three, under two, and over three. The sixth thread passes over three, under two, over three, under one, over one, and under one. The seventh thread passes under two, over three, under one, over one, under one, and over three. The eighth thread passes over two, under one, over one, under one, over three, under two, and over one. The ninth thread passes over one, under one, over three, under two, over three, and under one. The tenth thread passes over two, under two, over three, under one, over one, under one, and over one. The eleventh thread passes under one, over three, under one, over one, under one, over three, and under one.



Another patent has been granted for the manufacture of ribbed cloths, as velveteens and other fabrics of the kind. The patentee remarks that, in the weaving of the above kinds of cloth, the threads which constitute the warp are ordinarily used single or twisted together, but by his method the number of threads are increased by arranging them side by side in groups of two, three, four or five threads, and it is claimed that, by means of this arrangement of threads in groups, if one thread breaks, no defect is produced in the woven fabric, as is the case in the ordinary mode of manufacture.

The making of frisé fabrics which are woven on either hand or power looms with wires is the subject of a recent patent. According to this invention, such goods can be produced in power looms by double weaving, that is to say, by weaving one piece over the other, both pieces simultaneously produced as frisé fabrics. Double pile goods are produced either with one shuttle or by means of two shuttles in double shuttle looms, the two shuttles being shot simultaneously through the upper and lower webs. As is well known, when weaving frisé goods by means of looms with wires, the frisé knobs are produced by laying in special fancy wires which are not cut out but are drawn sidewise out of the fabric. But in the weaving of double velvet goods, as no such wires can be put in, the formation of the frisé knobs is effected in accordance with this invention by means of a special weft thread or pick. This weft thread, which we will call the frisé pick, does not bind into either of the two main tissues, but lies between them, and is utilised to form the frisé knobs Before the separation of the two pieces from each other, the frisé threads are removed during or after the weaving. For producing such goods with one shuttle, no new mechanism is required, but for the production of double goods with two shuttles, a special mode of changing the shuttles is required.

The decorating of woven fabrics with attached designs has become very fashionable lately, and, according to a patent granted a few months ago, the following method may be of interest to our readers. Stamped or cut out designs, preferably of cloth and of a different material and colour from the ground fabric, are sewn upon the ground material by either an ornamental or common silk or other thread, and they are then embroidered by specially made threads, which completes the decorative character of the design. The thread is made as follows:—The yarn or ground is made of any suitable fibre and colour, over which is spirally twisted a fine bright metallic wire or silk in such a manner that the appearance of the ground yarn predominates. By varying the colours of the thread to suit the colour of the sewn on design of cloth, very effective and novel designs of a decorative character are the result.

New Fibres.

Some time ago, a great fuss was made in a small way, over the invention or discovery of a new fibrous material called Berandine. All known textiles were expected to be depreciated in value by this intruder, but wool more than any other, because Berandine, being derived with little trouble from the woody stems of peat, could be put upon the market for that infinitesimal quotation generally spoken of as next to nothing. It could be mixed with other more costly fibres without disadvantage, but especially with wool. When critical inquiry was made into these pretensions, the verdict was decidedly against Berandine. It was said to be rough to feel and difficult to deal with, its inferiority was considered to surpass its cheapness, and it was thought very unlikely that it would injure the market position even of waste wool or cotton. M. Berand, after whom it was named, and the stuff, seemed to be snuffed out. Now we hear again that there is a future before the fibre, and fame in store for its originator. Undaunted by adverse opinion, the experiments of many years have been continued, and the fibre, in consequence of the improvements in treating it, can now be spun alone if necessary, or mingled with wool or cotton. "Common goods can be produced in an admixture of 30 per cent. of wool. Fine Berandine serves to make curtains, carpets, and common coverlets. With 50 per cent. of wool, beautiful fabrics are obtained for dresses, curtains, and carpets." But, best of all, in these hygienic days, it has been found that the material possesses strong antiseptic qualities, "that it is highly absorbent, and also serves to decompose vitiated gases in the air, and to purify the atmosphere from their effects. It is greatly recommended for tropical climates, as it absorbs the miasma thrown off at night from the overheated ground." This is what may be called a large order, and we must wait for some further intelligence.—*U. S. Economist*

A silk-like artificial fibrous material is obtained, according to the "Electrician," by the following process:—A solution is made of 4grms. nitrocellulose in 100 to 150ccm. of a mixture of equal parts of alcohol and ether; to which solution 2·5ccm of a filtered alcoholic solution of 1—10 commercial ferrous chloride (or stannous chloride) is added, and finally 1—5ccm. of an alcoholic solution of tannic acid. To prevent evaporation, the filtration is effected in a closed vessel. The liquid is then poured into a vertical reservoir which is provided at its lower part with the point of a horizontal blow-pipe of glass or platina, which is finely drawn out into a sharp pointed cone with an opening of 0·1 to 0·3mm, and whose edge must not be thicker than 0·2mm. This nozzle opens into a tub containing water which is acidulated with 0·5 per cent. nitric hydrate. The liquid in the reservoir standing several ccm. above the level of the tub easily flows into acidulated water in a thin stream, immediately congealing into a continuous thread, which is taken up and dried by passing it through a chamber in which a current of dry, but not heated, air circulates. The thread thus obtained is grey or black, but can be given any colour by adding dyestuffs soluble in alcohol or ether to the nitrocellulose solution. The thread thus produced is translucent, flexible, cylindrical, and smooth; has a silk-like appearance and feel, and burns, like silk, only so far as it is touched by a flame. On heating it in a closed vessel, the thread is slowly decomposed; it is attacked neither by cold nor hot water, nor by acids and alkalies of medium concentration. Although insoluble in alcohol and ether, it is dissolved by acetic ether. Several threads twisted together can be directly used for warp or weft, the threads having sufficient adhesion on leaving the nozzle; besides, some adhesive substance or size may be added to the liquid in the tub.

PATENTS.

Applications for Letters Patent.

Adjusting and regulating revolving flats of carding engines. E. Edwards, London.	31st Jan.	1,764
Attaching the clothing to carding engine flats. G. and E. Ashworth, Manchester.	20th Feb.	2,988
Adjusting the level of healds in looms, &c. J. R. Clegg, Rochdale.	23rd Jan.	3,231
Belts and bands. M. Bird and S. Wickens, London.	29th Jan.	1,575
Beaming yarns (apparatus). St. J. V. Day, Glasgow.	1st Feb.	1,781
Bobbins and carriages. A. Parsons, Nottingham.	8th Feb.	2,268
Breaking textile fibres. C. Tomlinson and J. Porter, Manchester.	11th Feb.	2,385
Bobbins (cap, ring spinning and twisting). T. Slingsby, Bradford.	16th Feb.	2,737
Bobbins, &c. R. S. Wood, Manchester.	19th Feb.	2,954
Bleaching, scouring, dyeing, &c., textile materials. E. Bentz, C. and A. Edmeston and E. Grether, London.	21st Feb.	3,105
Beaming and stripping cloth beams of beetling engines. R. Chambers, Carlisle.	22nd Feb.	3,179
Changing shuttles, operating stop rod and its attachments. J. and W. Horton, London.	28th Jan.	1,494
Coloured fabrics by printing or padding. C. and A. Edmeston, London.	30th Jan.	1,660
Cam for cop spinning mules. W. Lord and W. Butterworth, Rochdale.	31st Jan.	1,715
Cop winding frames. St. J. V. Day, Glasgow.	1st Feb. and	1,782 1,783
Cut-pile fabrics and apparatus. W. H. Gladding, London.	15th Feb.	2,712
Coloured cross striped figured quilt. J. N. Cosbey, London.	18th Feb.	2,861
Cutting pile of cords or velveteen during weaving. J. Brindle, R L. Reade, J. Taylor, and J. M. Moulson, Manchester.	19th Feb.	2,880
Carpets (Brussels and velvet). F. B. Fawcett, Kidderminster.	22nd Feb.	3,160
Cutting weft pile fabrics. O. Drey, Manchester.	22nd Feb.	3,183
Cooling cloth. A. Armitage and T. Carter, Huddersfield.	22nd Feb.	3,194
Cutting patterns of lace, &c. H. Henson, London.	22nd Feb.	3,220
Driving spindles. A. Sugden, Oldham.	5th Feb.	2,013
Dyeing yarns. T. Wolstenholme, London.	5th Feb.	2,060
Drying textiles, &c. J. Storhay, London.	8th Feb.	2,283
Drying yarns in hanks. R. H. Reade, W. Kennedy, and J. Mallon, Belfast.	9th Feb.	2,307
Doubling and like frames. W. Anderson and T. Whittaker, Stockport	15th Feb.	2,687
Dyeing mixed woven fabrics. T Ingham, Manchester.	20th Feb	2,984
Dressing silk waste. G. F. Priestley, Halifax.	20th Feb.	3,023
Damping warps in looms. J. Grime and T. Atkinson, Halifax.	23rd Feb.	3,239
Dyeing hanks of yarns, sliver, &c. H. F. Clayton, Huddersfield.	23rd Feb	3,271
Fibres (preparation) and apparatus. A. E. Tavernier and E. Casper, London.	28th Jan.	1,521
Finishing yarns. A. Hitchon, Accrington.	30th Jan.	1,638
Fulling textiles, &c. J. Russell, Glasgow.	7th Feb.	2,177
Fabrics for blinds. J. Gerrard, London.	7th Feb.	2,198
Facilitating the clearing and cleansing of yarns and textile fibres in winding, &c., machinery. H. Tetlow, Manchester.	22nd Feb.	3,171
Facilitating and securing accuracy in grinding flats and doffer, &c. J. Bullough, Halifax.	23rd Feb.	3,236
Gill boxes for preparation of fibres. J. Sawley, C. J. Garnett, and J. Stead, Keighley.	2nd Feb.	1,867
Gills or fallers. S. Greenwood, Bradford.	13th Feb.	2,524
Heald frames, healds and connections. T. Mosley, Huddersfield	15th Feb.	2,667
Healds (appliances therewith). F. W. Jepson and E. Cooper, Halifax.	15th Feb.	2,684
Imitation sealskin, &c. A. Walker, Huddersfield.	1st Feb.	1,804
Indicators for condensers, drawing frames and spinning mules. S. B. Storey, Armley.	5th Feb.	2,005
Jacquard harness looms. J. Wormald and G. Washington, Halifax.	14th Feb.	2,593
Looms. Wright Shaw, Manchester.	29th Jan.	1,552
Loom dobbies. J. and P. Johnson, Manchester.	31st Jan.	1,709
Lace. W. H. Smith, London.	31st Jan.	1,770
Loom dobbies. J. and J. E. Leeming, Halifax.	1st Feb.	1,790
Looms. R. Kirkman, London.	5th Feb.	2,065
Looms. F. W. Durham, London.	8th Feb.	2,261
Looms. J. R. Lord, Manchester.	15th Feb.	2,679
Looms. T. Taylor and T. Dawson, Manchester.	23rd Feb.	3,255
Moreen fabrics. H. Robertshaw, Bradford.	1st Feb.	1,797
Mules (spinning). J. Barlow and J. Booth, London.	11th Feb.	2,387
Opening and cleaning fibres. J. Andrew, London.	16th Feb.	2,770
Organzine or silk warp. J. E. Tynan, London.	19th Feb.	2,917
Ornamenting fabrics. P. V. Renard, London.	19th Feb.	2,976
Operating healds. J. F. and H. Rouse, Bradford.	22nd Feb.	3,152
Pickers. R. Gledhill and R. E. Field. Halifax.	30th Jan.	1,641
Printing in two or more colours at one operation. R. G. Horton, Whitchurch.	31st Jan.	1,734
Printing textile fabrics, &c., specially prepared. J. Heyde, London.	31st Jan.	1,759
Picking motion of under-pick looms. J. C. Fell, London.	12th Feb.	2,459
Picker preservers or check motions. J. Halliwell, Halifax.	13th Feb.	2,534
Pile fabrics. H. Rouse, Bradford.	21st Feb.	3,092
Pile fabrics (seals). S. C. Lister and J. Reixach, London.	21st Feb.	3,121
Printing lace, &c. M. Wadsworth and S. J. Pentecost, London.	18th Feb.	2,839
Pickers for Looms. W. E. Heys, Manchester.	23rd Feb.	3,233
Picking sticks for looms. T. Taylor and T. Dawson, Manchester.	23rd Feb.	3,256
Picking motion for looms. J. and H. Stanhope, London.	23rd Feb.	3,269
Reed motions for fast reed looms. J. Jucker, Manchester.	5th Feb.	2,012
Reed motions. J. Jucker, Manchester.	7th Feb.	2,202
Ring spinning and doubling. R. A. Johnson, Manchester.	16th Feb.	2,733
Square or bar-hemstitch on handkerchiefs and linen and cotton fabrics. J. McKisack and J. McDevitt, Belfast.	31st Jan. and	1,730 1,731
Spools. F. M. Marcy, London.	4th Feb.	1,991
Shuttles. A. Barber, Manchester.	6th Feb.	2,102
Shedding mechanism. T. A. Hinchcliffe and B. Ross, Bradford.	7th Feb.	2,186
Stamping, printing, embossing fabrics. F. Preston, Manchester.	8th Feb.	2,267
Scouring and washing wool. T. Burns, Glasgow.	9th Feb.	2,311
Spinning mules. J. Whitehead, London.	9th Feb.	2,336
Spinning and doubling. W. R. Sidebottom, Manchester.	6th Feb.	2,112
Shuttles. T. Rollinson, Halifax.	11th Feb.	2,381
Softening, scutching and cleaning fibres. J. O. Wallace, Belfast.	12th Feb.	2,452
Shedding motions. J. Wormald and G. Washington, Halifax.	14th Feb.	2,597
Spinning (wet) frames. W. Scott and J. Mackie, Belfast.	16th Feb.	2,751
Spinning and twisting. J. Farrar, Halifax.	15th Feb.	2,673
Shuttles. J. E. Camm, London.	18th Feb.	2,816
Sizing, bleaching, soaping and dyeing warps. S. Spencer and R. Holt, Manchester.	23rd Feb.	3,257
Tapes, braids, &c., on lace machines. E. Bradshaw, Nottingham.	6th Feb.	2,116
Tapes, bands, sacking, &c. L. Turner, Leicester.	7th Feb.	2,226
Tentering fabrics. J. Webster and C. F. Atkinson, London.	12th Feb.	2,424
Textile threads. J. H. Du Vivier, London.	13th Feb.	2,571
Textile fabric. C. J. Schott, Manchester.	14th Feb.	2,619
Tubes for spinning and twisting. C. H. Smith, Bradford.	22nd Feb.	3,151
Vats (dyeing). F. A. Blair, Glasgow.	16th Feb.	2,743
Velveteens, cotton velvets. H. Massey, Bradford.	18th Feb.	2,814
Woven fabrics and looms. H. M. Fouillet-Chevance, London.	1st Feb.	1,848
Winding or reeling. G. Balfe, Manchester.	2nd Feb.	1,877
Wire mails and healds. J. A. Greenwood, Bradford.	4th Feb.	1,932
Washing, dyeing, drying, &c. (continuously). A. Waldbaur, London.	18th Feb.	2,806
Washing and dyeing. E. Kemp, Croydon.	21st Feb.	3,132

Patents Sealed.

17,697	466	702	807	844	850	892	902
952	960	973	988	1,022	1,118	1,391	1,411
1,473	1,909	1,986	2,664	14,248	14,365	15,000	16,400
16,524	16,829	17,060	17,874	17,959	477	1,110	1,111
1,121	1,127	1,206	1,244	1,300	1,420	1,486	1,494
1,614	1,712	6,677	8,602	13,337	15,019	17,955	1,040
1,043	1,312	1,512	1,547	1,553	1,555	1,599	1,687
1,784	1,791	1,811	2,278	3,033	8,042	12,232	14,984
15,496	16,007	16,715	17,322	3	536	755	908
1,954	2,003	2,046	2,127	2,173	2,205	2,269	3,130
5,773	13,979	16,187					

Printed for the Publishers by JOHN DALE & CO., 17, *Bridge Street, Bradford, and Published by* HORATIO LORD *and* RICHARD THOMAS LORD, *at* 10, *Ann Place, Little Horton Lane, Bradford.*

The Journal of Fabrics AND Textile Industries.

Vol. 13. No. 92. APRIL 12th, 1889. Price 10d.

Contents.

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Looms for Woollen and Worsted Cloths.

SHUTTLING MECHANISM.

IN previous papers on this subject, we have sought to indicate the distinguishing characteristics of power looms specially constructed for weaving woollen and worsted goods, and to demonstrate, as far as possible, how the texture of the cloth, its compactness and solidity of structure, and also its uniformity of make, are qualities all liable to be greatly impaired by employing an unsuitable loom. Before treating of the various shuttling mechanisms in power looms, we would urge upon manufacturers to obtain the best build of loom for producing that class of goods of which they make a speciality. No power-loom, however well contrived, is adapted for weaving all branches of woven textures, and hence it is a question for the maker of textiles to determine which kind of loom is best suited to his requirements. All enterprising firms and first-class concerns are paying heed to the loom question; and there can be no doubt that if we are desirous of turning out sound and perfect goods, unequalled in fineness of structure and exactness of manufacture, the latest and most improved looms, though costly, must be procured. According to the present conditions of textile production, such looms are an essential acquisition to remunerative and progressive manufacturing. Because a type of loom is low in price, it is not to say that it is really cheap; in actual work, it will probably prove to be dear. We have experimented with certain builds of loom that would be costly at any price, for the simple reason that they were built on principles not compatible with the weaving of a firm and stable fabric. Whatever quality of yarns were used, the cloths always possessed a looseness and flimsiness of texture that gave them the character and appearance of an inferior article. It is an axiom that deserves particular attention that, however small the cost of a loom may be, if it fail to produce satisfactory pieces, there is so much loss on every end it turns out. This has been proved repeatedly. The repairing of badly woven cloths, resulting from incorrect loom movements, is at the best a costly process: hence, it is more economical, though more expensive at first, to procure looms of the latest and most improved arrangement. Some few years ago, in several textile localities, box-looms were rather the exception than the rule: this condition of things has, however, been completely reversed, so that now it is difficult to find a market for looms which have not got a shuttling capacity of 3 or 4 boxes at each end of the going-part. This very plainly indicates the vastness of the change effected in the fancy trades during the last decade. The fact is there is such a variety of fancy cloths—artistic in design and colouring, in wool, worsted, cotton, silk, and linen yarns—as was never produced at any previous time, or in any other country. What is more, the demand for fancy textures is on the increase; while that for simple effects becomes more limited every year. Patterns, coloured in both warp and weft, and hence made in a box-loom, are now an absolute necessity. Two boxes at each side of the lay were, for some time, thought to be all that were essential for the requirements of the trouserings and coating trades; but the latest looms are mounted with a series of 4 or 6 boxes, implying a shuttling capacity of 7 to 11 colours. We can scarcely examine one sample of fancy goods—providing it is not a stripe—in the manufacture of which several shuttles are not employed. Tweeds, worsteds, flannels, dress fabrics, and mantlings, are all alike in this particular. In some descriptions of dress stuffs, shirtings, lawn tennis flannels, &c., a very large range of weft colours is adopted, necessitating the employment of the circular or rotary principle of actuating the several shuttle boxes. In order that we may clearly understand what are the essential features of a good shuttling contrivance, it is important that we should consider the functions that the box motion has to perform. Firstly, it has to control the ascent and descent of the boxes By this is meant, not simply their elevation and depression but, their actuation according to the arrangement of shades in the pattern of weft. In a word, it must be so constructed as to be capable of bringing into play any particular colour in the entire series of yarns in the filling. This must be done, moreover, at the proper juncture, and with the completest accuracy. If the box is not precisely in position, with its base on a level with the race of the going-part, when the shuttle reaches the terminus of its traverse, an accident detrimental to the cloth, to the warp, and may be, to the loom, is likely to ensue. Evidently, there must be speedy, uniform, and correct, action. To attain these points, it is always desirable to have the mechanism for controlling the boxes actuated by the same parts as those communicating motion to the shedding apparatus. It is not a good arrangement to have the box motion entirely independent of the shed gear. They should, on the contrary, be in direct connection with each other. As these two contrivances require to be operated together, they can be most effectively kept in unison, when in motion, by having their movements governed by similar driving gear. There are some excellent looms in which this arrangement is not adhered to, the two motions—shedding and shuttling—being detached, each possessing isolated action: but as there is, on this system, more liability of variableness of movement, we consider that the former principle of actuation is the best, and the one which ought, wherever possible, to be adopted. Another matter in connection with the raising and falling of the boxes is steadiness of motion. It is not enough to lift and depress the boxes—this must be accomplished with a minimum of vibration. Anything approaching a jerking, uncontrolled descent is objectionable. The boxes should not be allowed to drop without any counteracting or balancing force being applied. Considerable vibration ensues from such a principle of depression. Of course, in some looms, the boxes drop in this manner, but, for the reasons named, it is a very unsatisfactory method, and one that ought to be entirely discarded. One of the latest, and, perhaps, one of the best methods of effecting the lowering of the boxes is by spring gear; thus they are lifted by a spindle or shaft round which is coiled a strong steel spring which checks their descent and effectually prevents what may be termed a drop or fall. But one more point about box mechanism requires notice—it relates to the costruction of the boxes. These are so shaped in many makes of looms, that the weaver cannot see the several shuttles without lifting the boxes in succession. When some 6 or 7 colours of weft are being used, it is very important that the loom attendant should be able to ascertain at a glance whether the shuttles are all filled with weft, their exact positions in relation to each other, and the colours they severally contain. What an improvement this is on the original dark chambered box, which the shuttle no sooner entered than it was out of view! Accurate weaving of fancy cloths is considerably facilitated when the boxes are of the former construction. The several features of an effective principle of box mechanism are as follow:—(1) It should be controlled and actuated by the same driving gear as the shedding appliance; (2) There must be perfect uniformity of movement, whether the boxes are rising or falling; (3) Steady and certain action; and (4) The boxes must be so constructed as to admit of the several shuttles being examined without either elevation or depression.

The Belgian *Bulletin du Musee Commercial* for the 16th February last states that the attention of Hamburg traders is drawn to the extraordinary development in Germany of the weaving of jute *(corchorus olitorius)*. The German merchants are too impatient to allow themselves to be supplied with this product through England, and two steamer services have recently been established for the special purpose of bringing jute from Bombay to Bremen and Hamburg direct.

New Designs for Fabrics.

In our March number, we gave a few samples of fabrics for ladies' and gentlemen's wear. These came to us from our agent in Paris, who sent them as specimens of the styles likely to be required. This month, we depart from the course adopted in our last issue, and give several original designs for dress materials, which have been specially prepared for us. At the same time, each design is quite suitable for a variety of purposes. We do not, however, offer them to the notice of our readers as anything new in style, but simply as good useful designs, coming within the scope of the taste and requirements of the coming season. There are seven of these patterns, the first six of which will be found

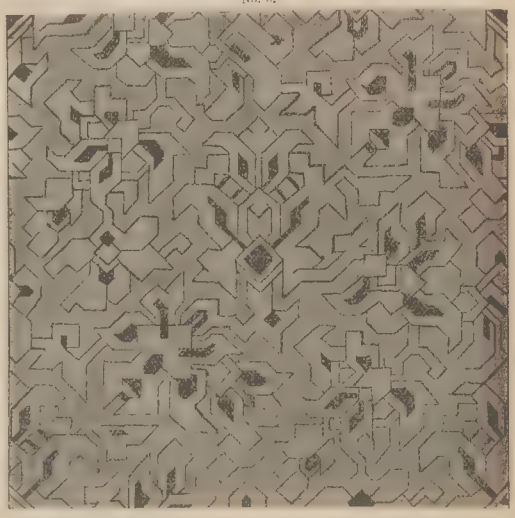
No. 1.

upon this page, and the seventh on our second plate, as it is too large to appear in our letterpress. Never, during recent years, has there been so much of the ornamental element introduced into fabrics for wearing apparel as at the present time, and we consider, from the opportunities

No. 2.

we have had of judging, that this demand should continue, providing manufacturers pay proper attention to the production of good designs skilfully treated as regards both construction and colouring. The expense of a few extra cards and an additional colour or two is an outlay about which many manufacturers are too ready to demur; this is a mistake, because it is not the particular make of cloth which sells, but some pleasant feature in the design and colour that attracts the popular taste. This is a principle—in ornamental fabrics—which, in a great number of instances, holds good. There are, of course, exceptions to this rule, as, for instance, in the case of a particular novelty in the make of a cloth. Then again, in order to produce the best things, skilful designers should be employed, men, who are not only good draughtsmen but, who possess good inventive faculties. This necessity is thrown too much into the background by many, and thus our rivals in France and Germany are getting the best of the race, for, besides such considerations as the longer hours, etc., which the German and Frenchman work, the skilful designer is an important factor in the competition. Upon the subject of dress materials, a contemporary says that the quantity of German goods in the London warehouses is

No. 3.



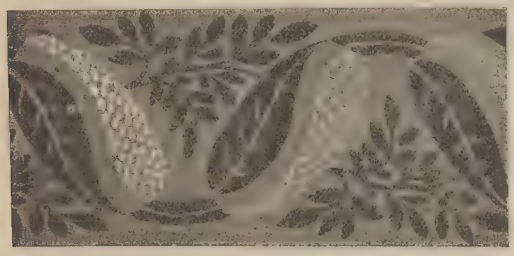
positively startling, whilst the French manufacturers are also sending a large variety of goods in plain and fancy styles. A feature adopted with regard to the German goods consists in putting each costume length into a separate box, and, along with it, there is a coloured plate showing the design of the costume. This is a feature which will commend the goods to intending purchasers, as it enables many ladies to have the materials made up in fashionable styles. However, we are digressing from the subject of new designs for fabrics, and, therefore, we will proceed to deal with the patterns here given. It will be noticed that, in their present form, the ornamentation is somewhat too minute for exact reproduction in

No. 4.

a fabric, but our intention is that they should be enlarged as the necessities of each user demand. No. 1 is a design in rosettes and leaves, with a trailing effect of balls over the ground. This is capable of being made into a handsome dress fabric to be used in conjunction with plain material of the same colour as the ground of the ornamental fabric. This applies also to Nos. 2 and 3. In No. 1, taking the ground as crimson, the figure would be effective in black, whilst the same colour would do equally well upon green, blue, brown, or other shade of ground. Another treatment might be adopted for this pattern, viz.:—two colours for the figure—the rosettes and leaves in one shade, and the balls in a distinctive shade, each harmonising with the other, so that neither is too pronounced. Also two shades might be used throughout the pattern, as

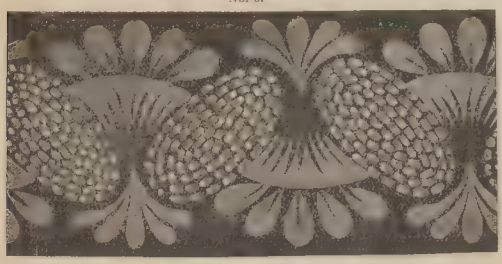
shown in the illustration. The ground could be in reseda, the balls in silver grey, and the figure in pale crimson and silver grey. The next pattern, No. 2, is in the Indian character of ornament, and three or more colours should be employed in weaving it. This is a style which, in other classes of ornamental fabrics, has, from time to time, been very popular, and we are, therefore, induced to offer it for dress goods, as we do not think much use has been made of the style for all over effects. For a dark material, navy blue ground with sage green and crimson figure would be effective, providing the latter colours are not too pale in shade. A lighter effect may be got by using reseda for the ground, with the ornament in crimson and navy blue, allowing a plentiful use of the ground colour also in the figure, so that it may not appear solid. Another very effective colouring could be gained by employing three shuttles. The warp colour should be silver grey, which would form the ground, the other colours being primrose, crimson, and black, with the ground colour working in the figure also to avoid its being too solid.

No. 5.



No. 3 is also in the Indian style of ornament, but it is not of such a set character as No. 2; the remarks as to the colouring apply equally to this pattern. Some other effects might be got by making the ground dark myrtle green or indigo, the other colours could be tan and crimson, or, for a lighter material, the ground might be fawn, with red and brown for the figure. We have seen a very pretty fabric with indigo ground composed of warp and weft, the leaves in yellow brown, and the flowers graduated from dark to light crimson, and from red brown to grey. The borders we give have been drawn by a French designer, with the exception of the last. The first one, No. 4, is a scroll, and would look effective with pale sage green figure outlined in gold, on fawn ground, or a pale grey ground with figure in pale peacock blue, outlined in olive green. No. 5 is also a border design for three colours—the

No. 6.



ground to be in a slate grey, the leaves, &c., in black, and the small ball or bead effect in white. This is a very pleasing and novel border pattern, as is also No. 6. The colouring for No. 5 is equally suitable for this design, and many other varieties might be obtained, as, for instance, reseda ground, grey figure, and white bead effect, or navy blue ground, Indian red figure and pink bead effect. The design, No. 7, which is given on our second plate, shows a broad border. From this design, a very good fabric could be made. It is intended for printed woollen dress material, but the pattern could be also woven, and would present a very handsome appearance. Three or more colours should be employed, and if effects similar to those given for the narrow borders were obtained, this could be used in connection with any of the three. Many pleasing varieties could be given to a pattern of this description. Taking a silver grey as the ground, a dark grey and a white would look well for the figure. A terra cotta ground should have the figure in black, pale peacock blue, and cream. Another effect could be gained by the use of dark grey ground, with black, yellow brown, and cream worked upon it. The last two would be very good, providing the black was carefully used in broad masses in the prominent portions of the ornament, care, however, would be required to prevent a patchy appearance. For more elaborate effects, a silver grey ground could have the figure in brown and gold, with bits of colour here and there, such as pink, pale green, and blue, obtained by changing the shuttle. Each of the patterns here given would be useful for printed dress materials and flannels, and if engraved for one printing, would look well on any shade of material.

Cotton Trade in Canada.

DURING the last few months, Textile Journals have teemed with accounts of the Cotton Trade in India. An account of the Cotton Trade in Canada—which, although not as important as the trade in the former country, may possess interest to many of our readers. Canada has now twenty-four mills, worked by twenty-two concerns, and this number will be increased this year by the erection of an experimental affair which is to engage only in the China trade, of which more in the future. All these mills are combination factories, that is both spinning and weaving are carried on in them. Some, however, sell yarns as well as cloth, and others bleach or dye and finish their own cloths. The list of the concerns is as follows:—

Name of Firms.	*Spindles.*	*Looms.*
Hochelaga Cotton Co. (*Two Mills*)	120,000	2,328
Montreal Cotton Co.	54,300	1,400
Canada Cotton Co.	50,000	812
St. Croix Cotton Co.	30,000	957
Merchants' Cotton Co.	27,000	700
Gibson and Sons, Limited	22,000	600
Stourmount Cotton Co.	27,000	650
Parks and Sons, Limited (*Two Mills*)	27,000	360
Nova Scotia Cotton Co.	20,000	450
Dundas Cotton Co.	16,300	508
Ontario Cotton Co.	12,000	362
Magog Textile Co.	10,000	300
Kingston Cotton Co.	11,000	310
Windsor Cotton Co.	11,000	270
Lybster Cotton Co.	12,000	260
Coaticoke Cotton Co.	12,000	250
Merriton Cotton Co.	12,000	248
Craven Cotton Co.	10,000	250
Moncton Cotton Co.	10,000	244
Chambley Cotton Co.	7,000	200
Yarmouth Duck Co.	4,500	48
Hamilton Cotton Co.	6,000	65
Totals	511,100	11,572

The mills that have bleach houses for piece goods are:—

Hochelaga Cotton Co.	Merchants' Cotton Co.
Montreal Cotton Co.	Canada Cotton Co.

Those that have dye houses for piece goods are:—

Montreal Cotton Co.	Canada Cotton Co.

Those that have bleach and dye houses for yarns are:—

St. Croix Cotton Co.	Dundas Cotton Co.
Gibson and Sons, Limited.	Ontario Cotton Co.
Stourmount Cotton Co.	Lybster Cotton Co.
Parks and Sons, Limited.	Merriton Cotton Co.
Nova Scotia Cotton Co.	Hamilton Cotton Co.

The Nova Scotia Cotton Co., however, only dye yarns for sale, whilst the others, with the exception of Parks and Sons, Limited, and Hamilton Cotton Co., dye for their own use. The two concerns last named dye for their own weaving as well as for the trade. Several of these mills are not filled to their full capacity. An approximate estimate of what certain mills could yet hold is:—

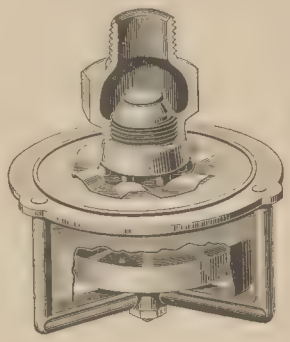
Name of Firms.	*Spindles.*	*Looms.*
Gibson and Sons, Limited	22,000	600
Nova Scotia Cotton Co.	7,000	30
Magog Textile Co.	25,000	300
Montreal Cotton Co.	15,000	
Totals	69,000	930

The premier concern in the Canadian cotton trade is the Hochelaga Cotton Co. It was one of the first started, and has been repeatedly enlarged. It manufactures white cottons (narrow and wide) grey cottons, canton flannels, towels and grain bags. It pays a quarterly dividend of 2½ per cent., and its shares are quoted above par. The other dividend paying concerns are the Montreal Cotton Co., Merchants' Cotton Co., and the Yarmouth Duck Co. The Hamilton mill is a private concern, and Gibson and Sons, Limited, and St. Croix Cotton Co., although limited companies, are worked as private concerns. The other concerns upon the list cannot be called dividend paying concerns, though most of them have paid one or more dividends at different times. In some cases, however, it has been shrewdly suspected that some, at least, have done so only by omitting to take off sufficient depreciation. Canadians have an opinion that machinery never depreciates, and that

it should be as good, and be worth as much money in ten years' time as at the time it was erected. The older mills have naturally done the best financially, as they had the benefit of a period of exceptionally good trade before the undue extension of four or five years ago, no fewer than fourteen mills having been erected, besides other mills being extended, during the last four or five years, most of which extensions occurred at the same time. The addition of 35 to 40 per cent. in production naturally brought about a surplus and very bad trade. Two years ago, through stoppages, this surplus was reduced, and goods began to be scarce. A Cotton Manufacturers' Association was formed to limit production and rule prices, but, after a life of less than two years, this association fell to pieces, owing to underhand work on the part of certain of its members. During this time, the weaker mills made some money, and had nearly recouped themselves for the losses of previous years. The trouble arose first with the manufacturers of coloured woven goods. These goods being the most overdone of any in Canada, naturally felt the break in the combination the worst. Prices went down at once from 17½d. per lb. to 14d. per lb., and even lower. At this price, it is probable that pure made coloured woven goods could be purchased in Canada as cheap as, if not cheaper than, in any country in the world. At this price, the goods were delivered free of all charges for carriage, and with a credit which would average six months. The goods woven at these, so called, coloured mills are tickings, awnings, denims, cottonades, fancy shirtings, ginghams, &c., and the production of some of the mills will compare favourably with goods of the same grade made in England The mills making grey domestics suffered considerably, the price running down from 11¾d. per lb. for pure goods to 9d. per lb. Several mills took large orders for export to China, which soon cleared the market from stock, so that, to day, all the mills are clear of stock and with orders in hand that will last some time Lately, another combination has been formed, comprising only the makers of these grey domestics, and current prices now range from 10½d. per lb. for cloths made from about 15's yarn to 11¾d. per lb. for cloths made from about 24's yarn. The bulk of the Canadian domestic cloths are pure sized, being sized with farina for weaving purposes only. One or two mills did so well out of their orders for China that one mill is now running nearly entirely on cloth for that country, and another mill is to be erected to undertake the trade. There seems but little doubt that so long as these China goods can be manufactured profitably in the States, they can be made in Canada with better advantage. A well erected mill, filled with the best modern English machinery, should, in Canada, produce these goods cheaper than in the States, and for these reasons:—A mill well equipped with the best machinery can be erected cheaper in Canada than it can be in the States. Labour, especially girl labour, is much cheaper. Water powers are as good and are cheaper. Raw cotton can be laid down as cheap, or cheaper, than it can be to New England mills. The manufactured cloth, if the mill is situated upon the Canada Pacific line of railway, can be sent to China at less cost than from the States. Coal, if the mill is wisely located, also costs less than in New England. The climate is certainly more severe than in the States, but on coarse goods this is not so much felt, and whatever the atmosphere outside the mill may be, in a mill suitably constructed, modifications may be made so as to do away almost entirely with any trouble on this account. In some parts of Canada, female labour can be had at a rate as low as in the cheapest districts in Lancashire. It has been a wonder to many that Lancashire capitalists have not given attention to this opening for a profitable investment.

Automatic Sprinklers or Fire Extinguishers.

In our last issue, we gave particulars of the mechanism and working of the "Witter" sprinkler, and in contrast to this we draw our readers' attention to the "Draper-Hetherington," made by Messrs. Hetherington and Co., Ancoats, Manchester. Its chief advantage lies in the fact that, after being in action, and having put out a fire, it closes itself automatically and thus prevents unnecessary flooding of a room. The Draper-Hetherington is unsealed. The sealed sprinklers are those which have their exit orifice closed by a valve or cap kept ordinarily in its place by solder, which fuses at a low heat. The unsealed sprinklers are those which do not depend for their action upon the fusion of any metal. The construction of the Draper-Hetherington sprinkler is simple but ingenious. There is a short hermetically sealed cylinder, exposed to the heat from below, containing a mixture of pure ether and alcohol. When the cylinder is subjected to a certain temperature, the volatile fluid expands and the concave covers are forced outward, thereby actuating the valves, and at once liberating the water. The orifice from which the water is discharged consists of a flat circular seat, on to which a button or mushroom valve is forced by the pressure of water. Just below this orifice, a corrugated brass washer is placed, which revolves rapidly when a jet of water falls upon it, thereby distributing the water over a large surface. In order to prevent the cylinder being cooled by the water, a brass shield is placed a little way above it surrounding the cylinder on all sides, but allowing the air to circulate freely round it. This shield protects the cylinder, not only from the water discharged from its own sprinkler but also, from adjacent ones. As soon as the temperature of the air falls below the point at which the sprinkler will "sprinkle," the liquid inside the cylinder begins to resume its original bulk, and the pressure of the water on the top of the valve closes it. As soon as the valve is closed, the apparatus is quite ready for action again if required, which is an important feature in this design. It is guaranteed to act any number of times without further preparation. Experiments have been made by competent authorities with a view to ascertaining their permanence under working conditions, their liability to deterioration by repeated action, and the chemical stability of the fluid contents of the cylinder. It has been proved that they invariably act between 135deg. and 138deg. Fah. in 1⅓ to 2½ seconds.; 139deg. to 140deg. Fah. in 1⅓ to 2 seconds, and 139deg. to 141deg. Fah. in 1⅓ to 2 seconds. These results prove the average constancy of the sprinklers to be very uniform, and the repeated action of each sprinkler causes no change as regards sensitiveness in the working of the instrument. After some fifty alternate heatings and coolings, the cylinder has been found to work at the original temperature of 139deg. to 140deg. Fah. These experiments prove that there can be no appreciable loss of the volatile material used to produce the increase of pressure. They have been heated, for a period of 15 hours, to a temperature sufficient to maintain a high internal pressure of the volatile vapour without any change, in the weight of the cylinder, due to any escape of the volatile substance. No leakage can take place in this sprinkler, as the water presses upon the top of the valve, therefore, the greater the pressure of water, the greater security against leakage. Practical tests were made recently at Messrs. Hetherington's works, the experiments being witnessed by the following directors from the Lower Moor Spinning Company, Limited: W. H. Simmonite, Esq.; B. Broadbent, Esq.; W. Davies, Esq.; T. Corliss, Esq.; Mr. H. H. Suthers, secretary; T. Shepherd, Esq.; and J. J. Wilde, Esq., Brighton Mill, Oldham. A wooden building had been erected in an open yard adjoining the works. It was constructed in height to represent a spinning room, and a quantity of shavings were spread on the floor. Four sprinklers were attached to the under side of the ceiling at four corners. The shavings were set on fire immediately beneath each sprinkler, and the doors of the building closed. The pressure of water in the pipes was about 31 lbs. The fire rapidly developed, and could be seen through apertures specially provided in the sides of the building. In thirty-five seconds from the time of lighting the fire, the sprinklers came into play and rapidly extinguished the flames. Of course, as the flames were extinguished, the temperature went down and the water stopped automatically, after running two minutes. The doors of the building were opened, and the spectators entered. Only the first layer of shavings appeared to have suffered from the fire, and those beneath were saturated with water. A fire was now made in the centre of the building, and farthest from each of the four sprinklers. In forty-five seconds, the clicking sound which denotes the opening of the valve was heard, and a copious shower of water descended. When it had accomplished its purpose and put out the fire, the valve closed at the expiration of two minutes and forty-eight seconds. The deputation expressed themselves as highly pleased and satisfied with the tests, and said the sprinkler had accomplished all that it had been credited with. An adjournment was now made to the works of Messrs. Hetherington, where further tests were made. A horizontal water-pipe had been erected, to which two sprinklers had been attached. They were heated by red-hot bars of iron until they opened and discharged water. They were then left to cool, and in 2¼ minutes in one case, and 2½ in another, the water was shut off. A number of tests were afterwards conducted by placing the cylinder in water heated to 136 degrees Fah., at which point the "click" went off, denoting that the valve had opened. The cylinder was then placed in cold water, and in a few seconds it resumed its concave shape. This was repeated half-a-dozen times with unvarying success, and evoked further expressions of admiration, and confidence in the value, of the sprinklers from the deputation



According to reports just issued by the Diplomatic and Consular Agent on Trade and Finance, we find that our woollen trade is still able to hold its own in France in spite of the recent talk about the rapid decline of English commerce with the Continent. The total of the trade in kilos with that country in 1887 was 5,598 and 5,845 in 1888. It is evident, therefore, that, in the words of the report, "Great Britain has had no serious competitors in the French markets for cloth or for mixed woollens. She sends broadcloth for nearly £760,000, and mixed cloths for about £840,000 to France."

New Zealand keeps her jubilee this year, and will commemorate the anniversary by an Exhibition at Dunedin. It will be open on November 20th, and close just after next Easter.

Dyeing of Wool with Alizarine Colour.

It was first proposed to substitute artificial alizarine for madder and red woods in 1878. Alizarine orange, in 1879, galleine, ceruleine, and alizarine blue, in 1880, came upon the market, followed by alizarine maroon in 1885; anthracene brown and galloflavine in 1886, and alizarine black in 1887. These constitute the alizarine colours as a class. The great obstacle in the way of their use has been their relatively high price. These colours are pastes and must be kept in well closed vessels where they cannot freeze, and where the temperature cannot rise high enough to occasion decomposition. When they are used, they must be thoroughly stirred to render them homogeneous All metallic oxides, including those of the alkaline earths, give coloured lakes with the alizarine colours, and for the colour baths and for dissolving the colours the water should bo free from all traces of lime, as the latter produces a lake without brilliancy and fastness. If distilled water is not to be had, then sufficient acetic acid should be added to the water to prevent the formation of this lake, one to two parts of acetic acid of 8° B. to 1000 parts of water. Even in dyeing with distilled water, acetic acid should be added, or the colour will be weak. The solution of the colour should be prepared with great care. The colour should be worked in 20-40 times its weight of water, treated as above with acetic acid, and finally passed through a sieve. Decantation will not answer. Certain colours should not be used in coppers, as copper decreases the brilliancy. This is true of alizarine blues and ceruleines.

Dyeing.—Dyeing with alizarine colours depends upon the property these colours possess of combining with metallic oxides to form coloured lakes. The chrome lakes are characterized especially by their fastness to air and light, their insolubility in water and alkaline liquids, and their resistance to carbonisation. Alizarine blue, galleine, ceruleine, anthracene brown, galloflavine, and alizarine black are used entirely with chrome mordants. Alumina mordants give fast and brilliant scarlets with alizarine reds Iron and tin mordants can be used with the alizarine reds and oranges. *Chrome Mordanting.*—For a box, use 750 gallons of water, 6 lbs. of bichromate, and 5 lbs. of tartar. Mordant 100 to 200 lbs. of wool at a time by boiling 1½ to 2 hours; after this, let the wool drain in a basket over night, and rinse until the water is colourless. For carded wool, use the same bath at 175° F. for 1½ hour, rinse, extract, and let the wool stand covered. For piece goods, boil for 1½ to 2 hours, drain, rinse, squeeze, and cover until needed. For the dyeing, use water corrected with acetic acid and prepare the colour as described. For dyeing uncarded wool, pour one-half the colour through a sieve into the dye bath, then introduce the moist wool and stir gently, adding a little colour from time to time. Raise to a boil by degrees, stir and keep at a boil until finished, which should take from 2 to 2½ hours. To have the work fast, the boiling must be sufficiently prolonged but, at the same time, should be moderate, that the wool may lie lightly and not felt. Thus, for the first hour, a temperature of 120° F. should not be exceeded, and a boil should only be reached when the bath is nearly exhausted. For woollen yarn or carded wool, work the wool in the bath until it is perfectly wet, raise, and add a third of the colour through a sieve, enter the wool and turn eight times, raise, and then add the remainder of the colour. For piece goods, wet the goods carefully; after the colour has been introduced, enter cold and work for 20 minutes, then heat slowly to boiling, not passing 130° F. the first hour, when the bath should be colourless, and boil until the colour is developed, perhaps 1 to 1½ hour. For rinsing, work 400 lbs. of fullers' earth into a solution of 6 lbs. of carbonate of ammonia in 100 gallons of water. Place 6 gallons of this mixture in a rinsing box, work the goods for 30 minutes, and then wash with pure water. If the dyeing is done in this way, it is perfectly fast to fulling, but this is not the case if the scouring had been imperfect, the mordanting too weak, too little acetic acid added, or the boiling too rapid or too short. Besides the ease with which they can be applied these colours offer considerable advantage in preserving the suppleness and softness of the wool. From this point of view, certain anthracene colours, alizarine and anthracene brown, are very useful in the place of the dye-woods which injure the suppleness and give difficulty in finishing, which is not the case with the artificial colours. They do not crock, and yarns of different colours retain clear shades. The dyeing of wool in alizarine red upon an alumina mordant presents interest enough to warrant special treatment. Galleine is a colour of great beauty, and gives blues and violets. Alizarine blue has a marked superiority over vat blue, particularly for medium and heavy shades on account of the ease and sureness of its application, and because it does not crock upon washing. These advantages are most marked upon carded wool, where vat blue causes many defects. Anthracene brown has one feature which renders it very valuable for wool-dyeing on piece goods and hats. It gives all shades from light to dark by using from 1 to 20 per cent. of the paste. Galloflavine is taking the place of the yellow woods. It is very fast and gives good shades, and merits attention. Alizarine black is interesting to dyers who use only chrome mordants, because it will give all tones from a light grey to a jet black. It is more advantageous than logwood with or without indigo on account of its fastness to light and acids. Used with other alizarine colours it renders good service in mixed colours.—*Industrie Textile.*

Action of Soda and Various Acids on Cotton.

M. Albert Scheurer has recently presented a paper on this subject to La Societe Industrielle of Mullhouse, in which the following data relating to the weakening of the cotton fibre are given. Strips of unbleached cotton cloth, 4cm. wide, were submitted to the action of solutions of caustic soda of different degrees of concentration, at a temperature of 150°C. for eight hours. Dynamo-metric tests were made on ten strips, both before and after immersion, with the following results:

Strength of solution.	Mean resistance of ten tests.
10 grm. of soda per litre of water	16·4
20 ,, ,, ,, ,,	16·6
40 ,, ,, ,, ,,	15·8
80 ,, ,, ,, ,,	16.8
Original cloth	16·9

Under these circumstances, therefore, caustic soda, even when used in solutions containing 80 grm. per litre, does not weaken cotton fibres. It had been observed in some previous experiments that the presence of air bubbles protected the cloth from the action of solutions, and, in the present instance, the cloth was moistened with alcohol before being submitted to the caustic lye. By this means, the absorption of the solution by the fibres was facilitated, and the effect of air bubbles avoided. The action of gaseous hydrochloric acid was next tried. A small quantity of concentrated hydrochloric acid of commerce was poured into a vessel, and pieces of bleached cotton cloth were suspended in the vessel above the liquids, so as to be exposed to the fumes only. The experiments were conducted at the ordinary atmospheric temperature, about 20°C. The very injurious action of these acid fumes will be realized from a perusal of the following figures:—

Period of exposure.	Mean resistance of ten tests.
Before exposure	24·3
After 10 minutes	15·0
,, 20 ,,	14·6
,, 40 ,,	9·6
,, 80 ,,	6·0

It will be observed that, even within the small space of ten minutes, the cloth had suffered considerably whilst, after one hour and twenty minutes, it had become practically worthless. Similar experiments were made with gaseous nitric acid, or nitrous fumes. Commercial nitric acid, 36°Bé., was employed, the experiments being otherwise the same as those with hydrochloric acid. The results were as follow:—

	Resistance.
Before exposure	24·3
After 10 minutes	21·7
,, 40 ,,	18·7

It would, therefore, appear that, although nitrous fumes are very injurious, they do not damage cotton fibres to the same extent as hydrochloric acid fumes do, when the cotton cloth is exposed to each for the same length of time, at the same temperature and atmospheric pressure. It must, however, be remembered that the tension of the vapour of commercial hydrochloric acid at 19°Bé. is greater than that of nitric acid of commerce at 36°Bé.; therefore, the latter acid would be more rarefied or diluted than the former in the atmosphere of the vessel in the above experiments. Therefore, the results only represent the measure of the comparative action of the vapours emitted by the two liquids under the stipulated conditions. The results of experiments with sulphuric acid are given in the next table. The cotton, before treatment, had a resistance of 24·4. The solution contained 2 grm. of 66° sulphuric acid per litre of water. The cotton fabric was immersed in this solution at a temperature of 83°C. in the first instance, and of 90°C. in one lot of experiments, with the following results for different periods of immersion:—

		Resistance.
1.	Not treated	24·4
2.	After 15 minutes	24·0
*3.	,, 30 ,,	24·0
4.	,, 30 ,,	22·0
5.	,, 30 ,, at 90°C	20·1
6.	,, 30 ,, at 83°, with solution containing 4 grm. 66° sulphuric acid per litre of water	22·6

These samples were afterwards subjected to the action of a boiling solution of sodium carbonate for a quarter of an hour, containing 2 grm. of the salt per litre of water. The resistance was then tried, with the following results:—

Sample 1	24·1
,, 2	23·5
,, 3	22·6
,, 4	17·9
,, 5	20·1
,, 6	21·5

These tests with the sulphuric acid at 80°C. indicate that the weakening only takes place after half an hour, whereas at 90°C. the action is much more energetic; but the subsequent boiling with sodium carbonate reveals a loss of strength increasing with the length of period of immersion in the sulphuric acid, whilst no excessive weakening is observed following exposure to higher temperature.

*There is apparently some mistake in the time given in this instance.

ORIGINAL DESIGNS.

On our first plate. we give a Portrait of the late Right Hon. John Bright, and in another place will be found a few remarks upon the deceased's connection with the textile industries of this country.

* * * * *

Our second plate contains a design for a Border for Dress Goods, a reference to which is made in an article on "New Designs" given on pages 38 and 39.

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On our third plate is a design for Cretonne. Each of these patterns has been drawn by Mr. R. T. Lord, 10, Ann Place, Bradford.

MONTHLY TRADE REPORTS.

WOOL.—During the early part of the month, trade in nearly all descriptions of wool was rather dull, but later, this feeling passed away and, although sales were mostly for actual consumption, the markets were cheerful, and prices had a hardening tendency. The difficulty with staplers seems to be, not inability to sell but, to replace their stocks so as to leave a margin for profit. In the country, prices are invariably as high as in the manufacturing centres, and any hardening tendency in the latter is at once taken advantage of in the former. Spinners of yarns have kept very busy, and new contracts have been entered into rather freely; this being especially the case with botany sorts, prices have been firm. In other descriptions, spinners have with difficulty maintained old rates. Twofold 32's mohair has had much inquiry, and business has been done freely, and, generally, medium quality yarns have sold well. The outlook for the future is very cheerful. The piece trade has been in a fairly satisfactory condition. Orders have been numerous and, where low rates have been accepted, bulky. Manufacturers, although fully engaged on old orders, complain much of the narrow margin for profit, yet it is with much difficulty that an advance is secured, and where higher rates have been given it has been for materials of a new and novel character. In the more effective fancy fabrics, good orders have been recently secured, and the same may be said of soft dress goods. Cashmeres and coatings have also sold freely, the latter in fair quantities for export.

COTTON.—The markets for the raw material have been fairly well attended, and sales have been about on an average. The consumption of cotton continues steady, and this fact has a tendency to keep prices firm and, generally, rates are from ¼d. to ⅜d. per lb. higher than they were at the corresponding period of last year. The trade in yarns has been of a rather dragging character, and prices, in consequence, have been irregular. Production has been above the consumption, and buyers, taking advantage of this, have offered lower rates with more or less success. This applies somewhat to weft sorts, whilst twist descriptions have about held their ground. New orders have only been small in bulk, unless they could be placed in heavy quantities at marked lower prices. In the cloth branches, there is little new to report. Makers of printing and shirting fabrics are well off for orders on the whole and, with few exceptions, are under contract for some time to come. A fairly steady business is being done in other fabrics, and prices generally keep firm.

WOOLLEN.—There has been an improved business done during the month. Repeat orders for spring goods have been so numerous as to prevent many manufacturers from commencing work on winter goods. From the patterns recently—and now being—shown to merchants for next season very satisfactory contracts have been entered into, and full time at the mills is likely to be the rule for some months to come. In the districts where the very low classes of goods are being made, there are complaints of a lack of orders of a remunerative character, and business has been comparatively quiet. On the other hand, where the best class of worsteds and tweeds are being made, a very cheerful feeling prevails, and the same may be said of fabrics for the ready-made clothing trade. In the latter branches especially a vast improvement has been made in the various departments of its manufacture, and in design and colouring some very effective patterns are now being put upon the market. As regards prices, there is but slight variation from last month, if there is any alteration, the tendency has been to rather higher rates.

LINEN.—The prospects of the linen trade have, on the whole, been brighter during the month, with the exception of the better class of table and such like damasks, the demand for which has been rather weak. On the other hand, there has been an increased inquiry for most other classes and a more favourable business has resulted than for months past. Fancy drills and sheetings have had an improved demand, as also have towels—plain and fancy, tea, crumb, toilet, and domestic cloths generally. Prices have improved slightly, and, on the whole, the prospects for the future are fairly bright.

LACE.—This branch of industry has been about as last month, and, generally, slow progress is made towards any permanent improvement in trade. Unless goods offered are a decided novelty, they only sell in moderate quantities. Fancy millinery laces have sold fairly well, as in these some new things have recently been brought out. Cotton embroidery trimmings have been in increased demand, both for home and foreign consumption. Valenciennes laces have recently grown in favour, and have been much inquired for. Prices have had a harder tendency.

The Late Right Hon. John Bright.

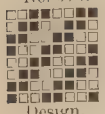
The death of the Right Hon. John Bright, which occurred so recently, has caused a blank amongst the public men of the nation which it will be difficult to fill. During the past few days, much has been written upon his parliamentary life—a life which is almost without parallel in the history of any country. Amongst the many reforms which he espoused, the foremost place must be given to the repeal of the Corn Laws and his general advocacy of Free Trade. However, it is not our intention to make special reference to his political life, as such would be out of place in our pages. It is rather with respect to his connection with the textile trade that we desire to pay a tribute of respect to his memory. Mr. Bright (whose portrait is given on our first plate) was born on 16th November 1811, at Greenbank, Rochdale. His father, Jacob Bright, was a native of Coventry, but he learned to weave at New Mills in Derbyshire. He married his master's daughter, and removed to Rochdale in 1802, where his 11 children were born. In 1809, a Manchester firm offered him capital and a partnership with them in a spinning concern they proposed to establish, the management of which was under his control, and the business was most successful. Jacob Bright's eldest son died young, the second—John—after undergoing a course of instruction in Rochdale, was sent for one year to the "Friends'" school, at Ackworth, of which Society his father was a member, but the son's health not being very good, he was educated for a time at home, and at the age of 15 was placed in his father's counting-house, where he passed the remainder of his youth. He was fond of sports, such as cricket, football, swimming, and fishing, but in 1833, when he was about 21 years of age, he appears to have turned his attention to other pursuits, and we find him making his first appearance as a public speaker in that year. In 1839 he contracted his first marriage with Miss Priestman, the daughter of a Friend residing at Newcastle-on-Tyne, and in the same year his house "One Ash" was built, where he resided up to the time of his death. On June 10th, 1847, he married his second wife, Miss Margaret Elizabeth Leatham, the daughter of Mr. Leatham, banker of Wakefield. Mr. Bright, although almost entirely devoted to politics, was a member of the firm of Bright Brothers and Company, cotton spinners, at Rochdale. In 1839, Mr. Jacob Bright, the father, retired from business, and the concern was carried on under the name of John Bright and Brothers. Business continued to prosper with the firm, and we find them adding to the cotton business that of carpet manufacturing, and this reminds us of the litigation between the Brights and Crossley and Sons, of Halifax, relating to the infringement of patents granted to the latter. The suit was one of the greatest which, up to that time, had occupied the attention of the law courts. After a trial at the London Guildhall in 1862, the case was finally referred to arbitration—Mr. Lush, Q.C., being the arbitrator. It was commenced in 1859, and was not concluded until early in 1864, and before a decision could be arrived at, both parties sent up to London looms which were fixed and worked by steam power. In the end, the decision was in favour of Messrs. Bright. Their factories are plain, substantial buildings, containing no fewer than 50,000 spindles and 1,000 looms. In the great cotton famine, Mr. Bright, along with his brothers, was instrumental in preventing that degree of suffering amongst their workpeople which was so prevalent in the manufacturing districts of Lancashire. Their factories had to run short time, but their hands were provided with the means wherewith to mitigate their distress. Their small wages were augmented by loans made by the firm, to be repaid by instalments when the distress had passed away. Besides this, a reading-room and school-room were fitted up in one of their factories, so that the enforced leisure of the hands might be profitably employed. Their tenants were allowed to live rent free, and in every way the greatest consideration was shown towards the sufferers from the famine.

Money orders may now be obtained at any money order office in the United Kingdom, payable at certain offices in the Orange Free State, a list of which may be consulted at any money order office. These orders should be forwarded direct to the payée for presentation at the office of payment, where the amount in sterling money, or its equivalent in the currency of the State, will be paid. The rate of commission is the same as that charged for money orders on other places abroad. The issue of money orders in the Orange Free State on the United Kingdom is now also in operation.

Fashionable Designs.

Trousering or Suiting.

No. 573.



Design.

2,240 ends in warp; 35 ends per inch; 8¾ reed, 4 ends in a reed; 36 picks per inch; 64 inches wide in the loom; 56 inches wide when finished. Weight 19 ozs.

Weft:—13 skeins all Brown.

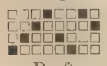
Warp:—

1 end	Red and Black twist,	16 skeins.
2 ends	Black,	16 ,,
1 end	Fancy twist,	6 ,,
3 ends	Brown and White twist,	16 ,,
2 ,,	Black and White twist,	16 ,,
2 ,,	Black,	16 ,,
6 ,,	Black and White twist,	16 ,,
2 ,,	Black,	16 ,,
6 ,,	Black and White twist,	16 ,,
1 end	Black,	16 ,,
1 ,,	Fancy twist,	6 ,,
6 ends	Brown and White twist,	16 ,,
1 end	Fancy twist,	6 ,,
1 ,,	Black,	16 ,,
6 ends	Black and White twist,	16 ,,
2 ,,	Black,	16 ,,
6 ,,	Black and White twist,	16 ,,
2 ,,	Black,	16 ,,
3 ,,	Black and White twist,	16 ,,

Mantle Cloth or Ulstering.

No. 574.

Design.



Draft.

Pegging Plan.

Warp:— All woollen.

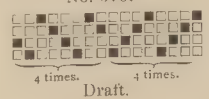
1 end	Red and Green twist,	3 skeins.
1 ,,	Light Brown.	5 ,,
1 ,,	Light Brown and Green twist,	5 ,,
1 ,,	Light Brown,	5 ,,
2 ends	Dark Brown,	5 ,,
1 end	Light Brown,	5 ,,
1 ,,	Light Brown and Green twist,	5 ,,
1 ,,	Light Brown,	5 ,,
1 ,,	Dark Brown,	5 ,,

Brown Weft, 5 skeins woollen.

1,152 ends in warp; 18 ends per inch; 9's reed, 2 in a reed; 20 picks per inch; 64 inches wide in loom; 56 inches wide when finished. Weight 27 ozs.

Costume Cloth.

No. 575.



Draft.

2,304 ends in warp; 36 ends per inch; 12's reed; 3 ends in a dent; 36 picks per inch; 64 inches in reed; 56 inches finished. 8 ozs. per yard. 36 skeins worsted warp and weft.

Worsted Trousering.

No. 576.

Design.

Warp:—

40 ends Brown and Green twist worsted, 2/40's.
8 ,, Brown and White ,, ,,

48 ends in pattern.

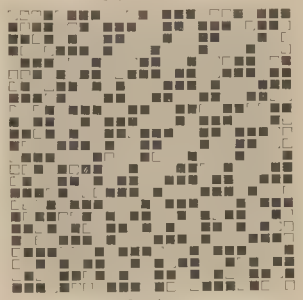
Weft:—Brown woollen. 24 skeins.

4,480 ends in warp; 70 ends per inch; 17½ reed, 4 ends in a reed; 70 picks per inch; 64 inches wide in loom; 56 inches wide when finished. Weight 16¾ ozs.

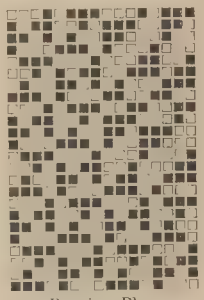
Cotton Dress Goods.

The following are designs for cotton dress goods. They should be woven in 60's sett, with 60 picks per inch. The warp should be 50's, and the weft 30's cotton.

No. 577.



Design.

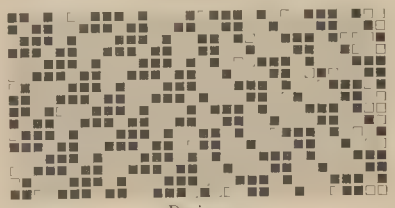


Pegging Plan.

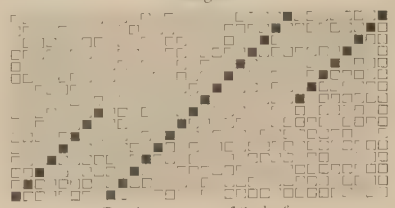
Draft. 16 shaft.

Pegging Plan for No. 578.

No. 578.



Design.

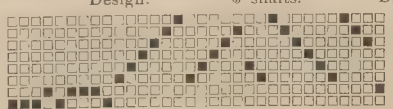


Draft. 16 shafts.

No. 579.

Design. 8 shafts.

Draft.

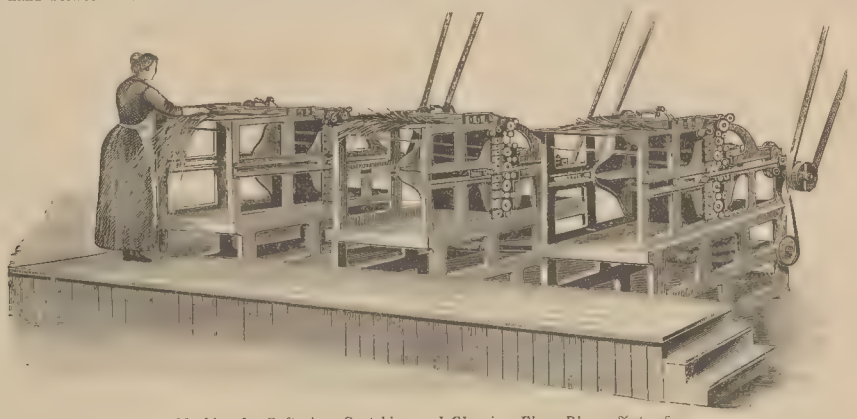


Pegging Plan.

MACHINERY, &c.

Improved Machines for Softening, Scutching and Cleaning Flax, Rheea, Jute, &c.

In a series of articles given in former issues of our Journal, we treated upon the preparation which rheea undergoes in order to make it as effective as possible for the production of fabrics. Since then, rapid strides have been made in the manipulation of this fibre, and, at an early date, it seems destined to make its mark in the textile industry. Our space will not admit of giving a resumé of the articles, but in these the conclusion was come to that with more experiments the use of rheea was certain to be a success, and this fact is now patent to those engaged in the manufacture of yarns and fabrics from this plant. The principal difficulty has been the removing of the fibre in a clean manner from the wood and other useless matter, and this seems to have recently been successfully accomplished by Mr. John Orr Wallace of Belfast, who has approached it from a mechanical standpoint. The machine, which was shown in operation at the recent Irish Exhibition in London, performed its work fairly satisfactorily, although it was not specially designed for the manipulation of the rheea fibre. The *Times*, commenting upon it, said:—"One thing is certain, and that is, that with a machine constructed for another purpose, and admittedly imperfect as regards the treatment of the rheea plant, the fibre of the latter can be, and is, obtained undamaged and fairly free from the woody stem." The annexed illustration gives a view of the apparatus. The flax, jute, or rheea, is fed by hand between a series of horizontal fluted rollers at the top of the machine These rollers are pressed against the stalks by means of steel springs, which allow the rollers sufficient play to admit of considerable variation in the size of the bundles which can be passed through them. After being crushed between these rollers, the stalks pass vertically downwards between a series of smooth rollers arranged in pairs, with intervals between them, which are pressed together by steel springs, as in the case of the fluted rollers. The rollers receive an intermittent motion by means of the ratchet and pawl shown at the top of the machine, which is driven from a shaft immediately above and parallel with the driving shaft, with which it is connected by means of toothed gearing. The pawl receives its motion from an iron rod and a crank, driven by a spur wheel on the shaft. On opposite sides of the vertical series of the smooth rollers is arranged a pair of slides, which receive a horizontal reciprocating motion from two pairs of cranks on the same shaft. The slide next to the shaft is actuated by the two inner cranks, and the further one by the two outer cranks, one of which is visible in the illustration immediately above the driving pulley. The slides approach and recede from the vertical series of rollers simultaneously. Each slide is furnished with a series of horizontal rows of hard steel pins, placed closely together, several rows being opposite to each of the intervals between the series of vertical rollers, and the motion of the slides and rollers is such that these pass through the stalks and separate the wood from the fibre, while the rollers are at rest. The rollers do not begin to move again until the pins have been completely withdrawn from the fibre, and cease moving before the pins enter again. The smooth and flute rollers are, moreover, connected by means of toothed gearing, so that they all move simultaneously. By this arrangement, any stress on the fibre, which was the principal cause of failure in the Cardon machine, is entirely obviated. To prevent the pins from becoming clogged by portions of the detached wood, or by extraneous matter entangled in the bundles, vertical brass plates or shields are fixed on each side of the intervals between the rollers. These plates contain rows of holes immediately opposite to the pins, which fit exactly into these holes, and they are placed at such a distance from the rollers that the pins are never completely withdrawn from the holes. These perforated plates are strengthened by the upper and perforated portions being bent into shape like an inverted L, so as to lie horizontally above each set of rows of pins, and also by means of attached horizontal plates between each row. The speed of the machine can be altered by changing the spur wheel which drives the rollers, and is in its turn driven by the rachet wheel at the top of the machine. This spur wheel is shown at the top of the front side of the machine. In order to allow spur wheels of different diameters to be used, the distance between the centres of this spur wheel and that gearing with it can be altered by means of the cam-shaped bearing shown in the illustration. The fibre, after passing through the machine, is carried on by an endless web, which receives its motion from a shaft and pulley driven by a belt from a small pulley on the driving shaft. When flax straw is being treated, the fibre is then removed by one of the attendants and "buffed" in a "buffer" of the ordinary revolving blade type, except that the blades are made lighter, as the straw is thoroughly broken up by the machine, and the buffing merely serves to remove any adhering portions of it. The buffer is shown on the left of the machine. The machine exhibited is capable of manipulating about 10 cwts. of retted flax in 10 hours, and the yield of fibre is from 25 to 33 per cent. of the raw material, according to the character of the flax. The machine requires three attendants—one to prepare the bundles of flax and hand them to the feeder, one to feed the flax between the rollers, and one to remove the fibre and pass it through the buffer; but the two attendants who prepare the straw in bundles and feed the machine can feed three or four more, and only one attendant for each extra machine, when placed alongside, is required to "buffer." Each machine absorbs about 2 h.p. Should an accident occur to any of the rollers, or of the tools carrying the pins, the injured part can be removed and duplicate parts supplied so as to start work again in a few minutes. Other fibres can be treated as well as fiax, but it is advisable to use larger and stronger pins for the coarser kinds. Rheea, hemp, New Zealand flax (phormium tenax), aloe, and agave have been successfully treated in the machine. The loss in the manipulation of New Zealand flax is only about 7 per cent. instead of from 30 to 35 per cent., as in the ordinary process. This saving, over that effected by machines in general use, marks the apparatus as one to be desired by all those engaged in this branch of manufacture, as such an economy will even, where only a moderate quantity of material is manipulated, quickly pay for the outlay entailed in purchasing a machine. This fact speaks volumes for the value of the apparatus, and of its being a distinct and effective advance upon that now in general use, and those who are interested in the working of the above-mentioned fibres would do well to put themselves in communication with Mr. Wallace, who will give full particulars as to machines specially adapted for the various fibres that may be required to be acted upon, and will also allow of inspection of machines working.

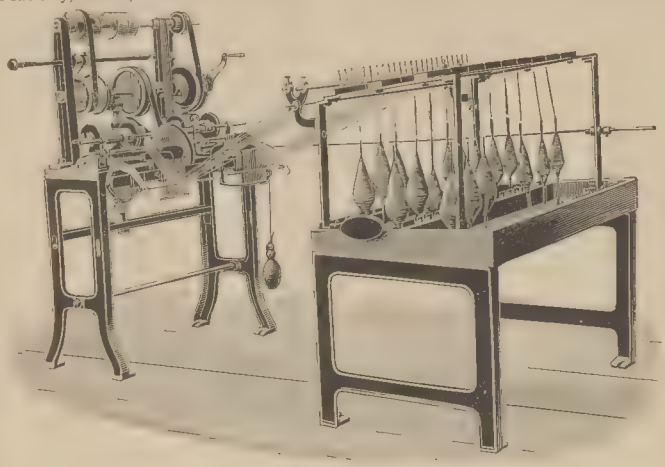


Machine for Softening, Scutching and Cleaning Flax, Rheea, Jute, &c.

Ornamental or Checkered Yarns.

Checkered yarns are usually prepared on the carding engine by applying bundles of differently coloured fibres crosswise to one of the carding rollers, or by strewing the coloured fibre on the fleece formed by the ground fibres. The principal feature of this invention consists in applying the differently coloured material in the shape of finished, or half-finished, threads, instead of using it in the shape of flocks, pieces of thread being laid cross-wise and at regular intervals over one of the carding rollers, preferably the doffer. The subsequent application of a layer of brown fibre to this roller and the combing action give a firm hold to the coloured admixture upon the ground fibres. The new apparatus chiefly comprises mechanism for the periodical feeding of half spun yarn across the doffer (parallel with its axis) and mechanism for tearing off the yarn thus fed forward, and for pressing the same upon the doffer. The two mechanisms operate alternately and in unison with each other. The details of construction may be as follow:—On one of the journals of the doffer is mounted a tooth wheel, having on its face a cam, and receiving rotary motion independently of the doffer. Only

about one half the circumference of the wheel is toothed, and, as long as its teeth gear with the pinion, an endless band placed parallel with the axis of the doffer and guided by a pair of pulleys is set in motion and draws coloured yarn from a spool by means of a separate friction roller, the said yarn being thus carried from one end of the band to the other. As soon as the front end of the yarn has reached the opposite end of the doffer, the spur wheel has ceased to gear with the pinion, and the endless band stops. During the further motion of the spur wheel, a lever, which is constantly pressed against the cam by a spring, moves towards the doffer and actuates a spring so as to clip the coloured thread between the band and the spring. The same motion of the upright lever serves to guide over the band a brush which tears off the thread. The thread thus torn off, and equal in length to the width of the doffer, is guided to the doffer and placed between the card teeth by a suitable motion of the brush. The end of the coloured yarns thus seized is held on the doffer by a friction roller or a curved guide, so that, during the rotary motion of the doffer, the yarn is laid on helically. During this time, the vertical lever mentioned above has been again pressed outward by the cam, the brush has receded, and the clip spring is released, so that it may act on a fresh piece of coloured half spun yarn. The coloured thread lying across the doffer is somewhat combed when passing the line of contact between the doffer and the carding cylinder. The fleece, finally scraped off the card cloth and provided with coloured cross stripes in the manner described, enters the fleece-divider, and the half spun yarn obtained from it has coloured specks at regular intervals. According as the speed of the spur wheel is twice, thrice, or more, times that of the doffer, two, three, or more, coloured stripes are laid on at each revolution. The doffer may be provided with several checkering appliances as described, which may operate alternately, so as to change the colour of the yarn. The checkering apparatus may be adapted to work with two or more threads of different colours, instead of working with one only, so that, after a thread has been cut off and transferred to the doffer, the corresponding friction roller is set out of action, and, at the same time, the following roller, which draws thread off a different spool, begins to operate. For every additional thread, a separate mechanism, comprising a friction roller and thread guide, may be added. Such a mechanism may be constructed as follows:—A pair of spools, one holding red, the other blue, yarn are mounted one on the other. The thread from each spool is guided between the corresponding friction roller and the endless band by a small separate guide roller, the bearings of which are pivoted to the fork which holds the journals of the friction roller. Each of the said forks is suspended from the extremity of a horizontal lever, and moveable vertically in a bearing. One of the two levers rests on a cam, and the other on a similar cam mounted on the same shaft, but placed at right angles to the first. On the same horizontal shaft, placed below the levers at right angles to the same, is mounted a ratchet wheel, and to the upper part of the upright oscillating lever (which serves to tear off the thread as described above) is pivoted a pawl adapted to turn the ratchet wheel in one direction only, but to yield, by pivoting on its fulcrum, when the lever moves in the opposite direction. By the motion of the ratchet wheel, the cams mounted on the horizontal shaft are turned also, and as each cam has four elevations and four depressions, and the ratchet wheel has eight teeth, the position of the horizontal levers is reversed whenever the ratchet wheel is turned one tooth. The small guide rollers mentioned above, being pivoted to lateral extensions of the forks holding the friction rollers, fall by their own weight against the circumference of the friction rollers, when the latter are raised, and thus clip the thread. Instead of placing the torn off piece of coloured thread upon the doffer, it may be delivered to an endless band of card cloth, which transports the same to the fleece immediately before entering the fleece-divider, the pulleys for the endless card cloth being mounted on the axles of the tension rollers of the upper dividing belt of the fleece-divider.



Warp Winding Machine.

Barron and Chambers' Warp Winding Machine for all kinds of Yarns.

An evenness of selvage or edge of woven fabrics is at the present day necessary to make a really saleable article, and it is generally acknowledged by manufacturers that an unevenness of edge has its effect on the commercial value of goods in all departments of the textile fabric industry. The chief fault invariably lies in the bad winding of the warp threads for the edgings. To overcome this defect, Messrs. T. and S. Barron, manufacturers of Drighlington, near Leeds, in conjunction with their foreman, Mr. J. Chambers, have invented an improved method of winding the selvage warp in such a regular and even manner that whatever number of threads or ends there may be, or whatever may be the variation in the thickness of the individual ends, the selvage warp will come off the bobbin on which it has been wound in a perfectly uniform manner, thus ensuring that the edge of a piece shall be regular and even throughout its entire length. We have had an opportunity of seeing the machine at work, and it proved very efficient, and at the same time we inspected a number of piece goods being woven, the edges of which had the selvage warps put in from yarn wound by the machine, and, in every respect, the result seemed satisfactory. The apparatus, an illustration of which is given, consists of one or more horizontal spindles, each of which carries a bobbin provided with a flange at each end and attached to each spindle, and, made fast thereon, is a small disc with a projecting pin, which pin—when the bobbin is in position for winding—projects into a corresponding hole in the flange of the bobbin, by this means causing the latter to revolve when the spindle revolves. Placed in front of the spindle is a flat sliding bar, which is caused to slide to and fro the length of the bobbin by means of a heart-shaped cam attached to a cross shaft located below the spindle and at right angles thereto, this shaft being driven by means of a perpendicular shaft and bevel wheels, which perpendicular shaft is driven from the main driving shaft by another pair of bevel wheels. Attached to the flat sliding bar is a reed or comb, through which the warp passes. Between the sliding bar and the spindle are two round guide bars or rods placed one above the other at a convenient distance apart, these rods being attached to, and sliding with, the flat bar. The warp, after passing through the reed, is conveyed underneath the bottom and over the top guide rod, which is provided with two adjustable guides for each spindle through which the warp passes; these guides are set so as to contract the warp into the form of a narrow flat tape or ribbon, in which form it passes on to the bobbin and, by the reciprocal motion of the sliding bar, a perfectly even and parallel bobbin is wound. The latter is held in position for winding by a bracket hinging on a pin; this bracket presses against the end of the bobbin, and is kept in a perpendicular position by means of a flat spring pressing on a flat surface formed on the underside of the bracket near the hinge pin. When it is required to take the full bobbin off the spindle, the swing bracket is pressed down into a horizontal position, thus leaving a clear course for the full bobbin to come away from the spindle. Part of the apparatus consists of an automatic motion for stopping the winding, should one or more ends of the warp become fast. The following will give an idea of the construction and action of this apparatus. A small bar which slides in guides is placed parallel with the spindle and is located between the spindle and the guide rods before mentioned; attached to this bar is a finger so formed as to come in contact with the end of the bobbin when required; a spiral or other spring is attached to the bar, this spring being in a state of tension when the bobbin is in position for winding, the finger on the bar being at the same time just clear of the end of the bobbin; the bar is kept in this position by means of a catch lever having its fulcrum at or near the middle, one end of which lever drops into a notch in the bar, thus holding it; at the other end of the catch lever is placed a disc free to revolve on a stud or pin having a projecting pin, and placed in such a position that, when the disc makes a part of a revolution, the projecting pin depresses the end of the catch lever, thereby releasing the sliding bar, which is then drawn forwards by the spiral spring attached to it, thus bringing the finger in contact with the bobbin, thereby disengaging the bobbin from the driving pin attached to the driving disc on the spindle, and also, at the same time, depressing the hinge or swing lever into a horizontal position. The motion is given to the releasing disc as follows:—Attached to the disc is an arm, at the end of which is rivetted, or otherwise made fast, a round projecting rod parallel with the spindle; the warp passes under this projecting rod before reaching the reed or comb, and should one or more ends of the warp become fast, the extra tension raises the rod, thereby giving motion to the releasing disc, bringing the projecting pin of the releasing disc in contact with the end of the catch lever, depressing the same and thus releasing the bar which is drawn forwards, thereby stopping the winding. The warp is drawn from cops placed in a creel, the ends being drawn over a tension rod, which can be regulated to different degrees of tension. The machine can be run by either power or hand. It occupies but a small space, and the price is really so low that it will undoubtedly have a ready sale. The saving which is effected in listings, labour, &c. by its use will quickly repay the cost of the apparatus. The patentees will be glad to afford those interested a sight of the machine in operation. We may add that it is equally adapted for the winding of all descriptions and qualities of yarns, from the finest of silk to the coarsest of fibres.

The Treaty of Commerce between Great Britain and Servia, signed February, 1880, will terminate in May, 1890.

An Improved Carboniser for Woollen and other Rags.

In former issues of this Journal, we have referred to the various improvements that have been made in the mechanism, &c., of carbonising apparatus, and in some cases the advantages gained have been such that users of wool which contains burrs, straw, seeds, and also of rags containing cotton or any vegetable matter, have seen the utility of having machines erected on their own premises for the purpose of carbonising, thereby saving considerably in time and money. One of the latest improved machines was brought to our notice a few days ago by Mr. J. Illingworth, of Whitelee, Batley, who is a shoddy and flock manufacturer on a large scale. For some years he has studied the question of carbonising in its varied aspects, with the result that the apparatus he has hitherto produced has been considered by users to be the most effective for the purpose of destroying cotton and vegetable matter generally. Numbers of testimonials have come under our notice bearing out this. We have given descriptions of a number of his improvements on former occasions, but, although these have proved very successful, still his last attempt will give advantages which, in comparison with former efforts, leave little to be desired. The new machine, which we had an opportunity of seeing at work, is reduced in its various parts to a state of great simplicity, and as this is generally considered one of the chief points in any mechanism, it ought, from this fact alone, to make its mark in the branch of textiles for which it is adapted. Another leading feature is that its feeding as well as its delivery arrangements are accomplished automatically. Again, the quantity of gas used for carbonising a given quantity of material is much reduced, a considerable item being saved on this in comparison with the cost by processes now in vogue. The nuisance hitherto caused by a greater or lesser escape of gas is also entirely obviated, this in itself being an undoubted recommendation in its favour, and, we may add, that the corrosive effect generally caused by acid gas on the various parts of a machine have been reduced to a minimum. The apparatus is easily fixed, being enclosed in a solid erection of brick and concrete, and it is put together in such a manner that, should an inspection of any part be required, it can be accomplished without the removal of either a single brick or of any part of the machine. The apparatus we had the pleasure of seeing at work carbonises one ton of rags per day, but a smaller or larger quantity can be worked according to the size erected. We are not at liberty at present to give a detailed description of the mechanism, but may be able to do so at a later date. The following particulars will give a good idea of its adaptability to turn off a large quantity of material effectively. The carboniser consists of a chamber made in such proportions as are required, the gas being introduced for the purpose of carbonising in a suitable manner, and in such a way that it attacks equally whatever rags are in the machine. The rags are put into a hopper at the feeding end of the machine, and at given intervals of time, these are delivered by an automatic arrangement direct into the chamber, are then carried gradually its whole length, and delivered automatically. A boy can fill the hopper at the feeding end, and then can go on with other work until it is required to be filled again, so that in this, an economy is effected. On delivery, the rags can be allowed to accumulate until there is a heap, when they can be carried away at one operation. The machine, unlike others now in general use, is continuous in its work, no time being lost by having to stop the machine, let out the gas, remove the rags and fill it again. All this work is entirely obviated. It will be readily seen that the advantages of the continual working are great. When the machine is put off from work, the gas escapes through a pipe and is carried into a flue leading to the chimney, any nuisance being thus provided against. Waste gas is also carried off in the same manner. Mr. Illingworth will give full particulars and advice as to the erection of the carboniser, and will allow of an inspection of the one he has now at work. We may add that he intends shortly to erect a machine of larger dimensions which will, of course, turn out a proportionately larger quantity of rags, with a corresponding saving of time and economy in working.

Machine for Dyeing Worsted Tops and Slivers.

The object of this invention is the production of evenly mixed dyed yarns of various shades of colour blended together, so that, when woven into a cloth, the cloudiness found on woven mixed fabrics will not be present. Mixed coloured yarns have been produced by dyeing the whole of the tops or slivers and blending them with tops or slivers of other colours, or undyed; but, in consequence of the variation in the length of the staple, some fibre being much longer in the staple than others, the blending of the colour has produced uneven and cloudy yarn, consequently, when woven into a fabric, the unequal shade of the yarn has made the cloth cloudy or streaky. To carry out this invention, the top or sliver is dyed in such a manner that parts of the tops are dyed one colour and the remaining parts are left undyed in the grey or ground colour, that is to say, the top is dyed in blocks and spaces; for instance, the part to be left undyed is blocked, and the space left between the blocked part is left for dyeing; or, in other words, one part of the sliver is covered and not exposed to the dye liquor, whilst the remaining part of the sliver is uncovered and, therefore, exposed to the liquor. After the top has been thus dyed, it is combed or otherwise similarly treated, by which means the blending of the dyed or undyed fibre will be equalized, producing yarn of even shade throughout, consequently, when woven into a cloth, the cloudiness hitherto complained of will be absent. The apparatus employed for dyeing tops and slivers in blocks and spaces comprises grates or bars placed one above another with the fibre between each grate or bar. The grates or bars thus arranged are drawn tightly together by screws or clamps and placed in a dye vessel to be immersed in the liquor, by which means, the uncovered parts of the fibre will be dyed, whilst the parts of the fibre covered by the grates or bars will remain undyed. If necessary, the grate or bars may be covered with india rubber or other suitable yielding material. The top or sliver is wound around a grate or series of bars in any suitable manner, but the patentee prefers to mount the grates in suitable bearings or pedestals, and, on rotary motion being given to them, the top or sliver is evenly wound on them. When dyed, the grate may be taken back to the pedestal bearings, and the dyed top unwound again. This can be done without disturbing the condition of the top. The sliver, being wound on the grates or bars, may be guided by a traversing eyelet, and made to stop automatically when the eyelet has reached the end of its stroke. Instead of employing flat grates or bars for dyeing slivers in spaces intermittently a cylindrical cage may be employed, around which the sliver is wound and kept thereon by bars placed parallel to the axis of the cylinder, the arrangement being such that the fibre between the intervening spaces of the bars is exposed to the action of the dye liquor. If desirable, there may be several layers of sliver, each layer resting upon separate rows of bars; by which means a large quantity of fibre can be dyed at one operation. The bars of the grates may be arranged diagonally, so that the slivers may be dyed in diagonal divisions.

Drawing Thread or Yarn from Woven Cloth.

An invention has been patented, the object of which is to provide a machine by means of which a certain length of the weft yarn may be withdrawn from a woven textile fabric and reeled for the purpose of testing it. It is designed specially for use with grey cloth, but may be applied to others where found desirable. It consists essentially in an apparatus in which the weft thread, or yarn, will be withdrawn and reeled, while, at the same time, the ends will be successively cut away from the warp threads after the weft has been withdrawn from them. In carrying out the invention, a pair of rollers, or suitable holders or supports, will be provided to hold the cloth while the thread is being withdrawn, and a reel suitably placed, preferably on a vertical spindle in front of them, upon which the yarn as withdrawn will be wound. In front of the rollers or holders will be placed a knife or shears with a reciprocating movement which will, at intervals, cut off the exposed ends of the warp threads. Below the knife is placed a supporting block for the cloth, upon which the edge or ends of the warp threads will be cut, but a blade forming shears may be employed instead. The rollers or holders for receiving and passing forward the cloth, the reel for winding the weft thread or yarn as it is withdrawn, and the knife or shears for cutting or severing the ends of the warp threads are all actuated by suitable mechanism of levers and shafts and gear wheels arranged closely and compactly together. A shaft is placed running longitudinally beneath or at the side of the machine. A crank on this shaft communicates motion by means of a connecting rod to the knife or shears. Motion is conveyed from the same shaft by means of a second shaft geared thereto to the reel upon which the yarn is wound, which rotates rapidly as the first shaft is turned. A counter or indicator is mounted on the shaft of, or otherwise connected to, the reel, to indicate when a given length, say a lea or 120 yards, has been wound upon it. A third shaft, geared to either the first or second, drives the feed rollers or holders. It is evident that this arrangement of mechanism for actuating the apparatus may be modified, or mechanical equivalents substituted therefor, as the essential features of the invention for withdrawing and winding the weft yarn and cutting off the exposed ends of the warp threads may be actuated in any convenient way. In addition to, or in combination with, which there may be provided a scale to receive the yarn when wound to indicate thereon, by the weight, the strength or other quality of the yarn. Such scale may be in the form of a lever formed with a hook to receive the yarn, and a weighted lever and pointer to indicate on a quadrant or other scale the weight or strength for which the test is made.

Custom House Process for Finding the Weights of Cotton and Wool in Tissues.

The scientific department in the French Customs now adopts the process based on the principles that alkalis have the property of dissolving animal fibre. This principle, though enunciated years ago, has been tried on many occasions, and the procedure has been considerably modified. The modus operandi now is as follows:—The pieces of the material to be analysed are cut, and the weight of each, say two grammes, is made to correspond. These pieces are marked respectively A, B, and C. The first is set aside, and B and C are submitted for 15 minutes to a boiling solution of hydro chloric acid, 3 per cent., so as to remove the dye and dressing, they are then repeatedly washed and are marked B and C. The piece B is then set apart, and the sample C is submerged for 15 minutes in a boiling solution of caustic soda (density 1020). The wool dissolves, leaving the cotton threads, which are then denominated C. The fragments, A, B, and C, are placed in a heated pan, 100 degrees, and left there for two hours, they are then taken out, and are left for 24 hours in the open air; the pan selected must be a dry one. At the end of this time, A, B, and C are respectively weighed. A—B represents the weight of the dressing and of the dye, C represents the weight of the cotton—but to the cotton, being slightly attached by the solution of soda, experience has found that it is desirable to add 5 per cent. to the weight found. A similar method is applied to mixtures of wool and cotton, but, in this case, as the dressing generally consists of fatty matter, the threads are first of all boiled for 10 or 15 minutes in a hot solution of carbonate of soda to two degrees Baume. They are then placed for a quarter of an hour in the acid bath at three degrees and boiled. Finally, by way of precaution, and in order to take away the traces of greasy acids that might result from the decomposition by hydro-chloric acid of a small quantity of soap formed during the first operation, it is well to put the threads for 15 minutes into the warm solution of carbonate of chalk to two degrees Baume.

Tariff Charges and Customs.

SWITZERLAND.—All cotton tissues, figured, whether they are unbleached, bleached, or manufactured of dyed or printed yarn; duty, 16 frs. per quintal.

ITALY.—Small shawls of woollen texture mixed with silk, with an imitation fringe of wool; duty, 300 lire per quintal, and with an addition of 50 per cent. for sewing. Velvets of cotton and wool for slippers; duty, 240 lire per quintal.

GREECE.—Cotton, raw; flax, raw; jute, raw - Free
Cotton tissues, coloured, used for lining - - Oke. 1 Dr. Lep. 00
Cotton straps for engines - - - - - Free.
Cotton flannels in pieces, white or coloured, and for any use whatever - - - - - Oke. 1 Dr. Lep. 1·50
(*Note.*—The above-mentioned duties are applied to woollen flannels in pieces of any colour and kind).
Cotton tissues, fine, for lining, (ladies' dresses) stiffened, Oke. 2 Dr. Lep. 00
Tissues as above, of flax, hemp, or jute - - Oke. 4 Dr. Lep. 00

Packages of any sort, in which goods are imported, exempted from duty or not, and being such as are to be used independently, are subject to a special import duty, excepting the case when, in accordance with the tariff or royal decrees on tare, they are subject to a duty together with the goods which they contain. Royal decrees will fix those packages that are subject to no duty. Exhibits sent from abroad to exhibitions in Greece will be delivered by previous permission of the Minister of Finance to the exhibition committees under the same conditions of transit and under their personal responsibility, by their granting a personal guarantee. The bond will be cancelled by the return abroad of the exhibits within three months from the official termination of the exhibition. Otherwise the committees will be obliged to pay import duties, wharfage, octroi, and other dues. Exhibits sent from Greece for like objects will be exempted from duty.

Note.—Drachme = 9$\frac{5}{8}$d. Oke · 2·8 lbs. avoirdupois.
Cubic metre = 1·3 cub. yard.

UNITED STATES.—So-called cotton rope, consisting of a large cotton cable or rope about 2½ inches in diameter, and composed of very fine cotton threads twisted in thick strands, the strands being wound around a common stem, which is also composed of three-ply cotton cord, and which is intended for use in manufacturing establishments as a substitute for belting, and also for hoisting purposes, the same not being capable of being used as rigging for vessels is held to be dutiable at the rate of 35 per cent. *ad valorem*, under the provision in Schedule I. (T. I., 324), for "all manufactures of cotton not specially enumerated or provided for in this act." Certain worsted coat linings, though similar to the light-weight cassimeres sometimes used in the manufacture of negligé shirts, are dutiable under the provision for coat linings, composed in part of wool, worsted, &c., under T. I., 365. Ordinary wearing apparel, such as silk hose and silk gloves, is not free of duty as regalia when imported for use by clergymen in religous ceremonies. Samples.—A quarter of a complete pair of curtains, only large enough to exhibit the pattern, is held to be free of duty under synopsis 4828.

PERU.—Packing for machinery, all kinds; belting for machinery; do. for weaving cloth, &c.; sewing machines, pedal or hand action, also frames for knitting stockings, with or without drawers, excepting such as may be classed as ornamental furniture—free

FIJI.—Drapery, including apparel and slops, and all materials composed wholly or in part of cotton, silk, linen, or wool—12½ per cent and of floorcloth—10 per cent. *ad valorem*. Cotton, canvas, fibre ginning and spinning and weaving machinery—free.—*Board of Trade Journal.*

Duty on Mixed Woollen Goods.

An interesting rule was made by United States Circuit Judge Lacombe at New York, in the case of Luckemeyer et al. vs. Magone. This was an action brought to recover excessive duty alleged to have been collected on an assignment of woollen goods. The goods contained from 1 to 4 per cent. of cotton in the warp, the cotton and wool being so mixed that the former could not be detected except by chemical analysis. The question was whether the goods should be classed as mixed goods paying a duty of 5c. per yard, or as all-wool dress goods paying duty of 9c. per yard, on the ground that "threads of other material" were mixed with the wool for the purpose of changing the classification. The judge instructed the jury that "threads of other material" as used in the tariff law meant "threads wholly of other material," and the jury gave a verdict for the plaintiff.

New Patent Fabrics, &c.

IMPROVED CORSET CLOTH.

This invention refers to the manufacture of an improved corset-cloth, or coutil, or other similar fabric, by which ventilation is more efficiently ensured in corsets or other garments made therefrom than heretofore. In carrying out the invention, the warp upon the beams in the loom is so arranged as to leave spaces between the warp at suitable intervals to form stripes in the woven material, and over which spaces the weft is carried alone in the process of weaving the cloth. In this manner, a cloth is woven which has the appearance of a striped material, and, as the stripes only consist of weft and are of an open texture, free ventilation is permitted through them.

BILLIARD CLOTH.

This invention relates to improvements in the manufacture of cloth for billiard tables, bagatelle boards, and the like, and has for its principal object the production of a cotton cloth which has the appearance, feel, and finish, of an ordinary woollen billiard table cloth, but costs much less to produce than the latter. To effect this object, a cotton cloth is woven, care being taken to obtain fineness of grain, softness and pliability, combined with the thickness or solidity and strength necessary for the effectual covering of a billiard table or bagatelle board. The cloth thus woven is then fulled or milled, and scoured and then dyed, preferably, a green shade, and subsequently finished. If required, the surface of the cloth may be teased or raised, so as to give it a certain amount of nap. In the manufacture of this cloth, a warp, or warps, of dyed cotton is employed to produce a cotton fabric possessing the necessary thickness and pliability for a billiard table cover, and a weft of fine soft spun dyed yarn is used in order to give a softness to the fabric, but other kinds of cotton weft may be used. After being manufactured of the colour desired, say a green colour, the fabric is, or may be, slightly fulled or milled and scoured, by which means it is rendered closer or denser in texture, and also strengthened. After being dried, the fabric is subjected to a slight teasing or raising operation in order to produce a short soft pile or face, but, if desired, this latter operation may be dispensed with. The improved cotton cloth thus manufactured and treated possesses the appearance and feel of a cloth made from wool, and costs much less to produce. The cotton cloth also is of greater strength and is, consequently, less liable to cut or tear when being stretched or played upon.

FANCY CLOTH.

An improved cloth is made of woollen or camels' hair, and mohair, or alpacca, and may have a coloured slub yarn, or, for a lower class of cloth, worsted or botany may be substituted for the mohair.

The mohair is put in the warp according to the design required, the rest of the warp being woollen; for the lower class of cloths, worsted is substituted in the warps for the mohair; by this means raised stripes, checks, or other designs, are formed at intervals upon a ground of woollen in stripes, or checks, or other variety of pattern or design; the mohair or worsted is raised by ordinary raising and finishing machinery, and stands out above the rest of the cloth, whilst in, among, or near, such raised stripes or designs may be the coloured slub yarn of varying thickness. A knotted yarn of any colour may be placed amongst the mohair which, when finished, produces a flakey appearance of the cloth.

Commercial Failures.

According to *Kemp's Mercantile Guzette*, the number of failures in England and Wales, gazetted during the five weeks ending Saturday, March 30th, was 576. The number in the corresponding five weeks of last year was 498, showing an increase of 78, being a net increase in 1889, to date, of 9. In addition to these gazetted failures, there were 370 Deeds of Arrangement filed at the Bills of Sale Office during the same five weeks. The number filed in the corresponding five weeks of last year was 353, showing an increase of 17, being a net increase in 1889, to date, of 156. The number of Bills of Sale published in England and Wales for the five weeks ending Saturday, March 30th, was 1135. The number in the corresponding five weeks of last year was 1556, showing a decrease of 421, being a net decrease in 1889, to date, of 652. The number published in Ireland for the same five weeks was 46. The number in the corresponding five weeks of last year was 56, showing a decrease of 10, being a net decrease in 1889, to date, of 38.

Book Notice.

STAUB'S TEXTILE READY RECKONER. *Geo. Thomas and Co., Manchester.*

We have had our attention drawn to Staub's Textile Ready Reckoner. This work will be found useful to manufacturers and technical students in calculating the structures of cotton, woollen, worsted, linen, silk, and mixed fabrics. The work has been compiled by Emil Staub, and is consequently of German orign, but it has been translated into English by Messrs. George Thomas and Co., Deansgate, Manchester. After a close examination of the book, we can recommend it to the attention of our readers, as the practical information which it contains relative to the fabrics above mentioned is most valuable. The book includes a number of tables, amongst them being weight tables, tables of diameter of threads, shrinkage tables for the fabrics mentioned, calculation tables of cost of production of cotton goods, tables showing production of looms, &c., &c.

According to the *Journal de St. Petersbourg*, a congress of flax growers met last month at St. Petersburg. This congress had under discussion the measures which should be taken to prevent the depreciation and adulteration of flax, and to establish a central office for the sale of Russian flax on foreign markets without the aid of agents.

PATENTS.

Applications for Letters Patent.

Adjusting tension of threads. W. Benson, London.	7th Mar.	4,030
Attaching new tubes to old wharles in spinning and twisting. J. and E. Boocock, Bradford.	12th Mar.	4,292
Beams or spools for holding or carrying yarns and threads. L Bridge, Accrington.	1st Mar.	3,632
Breaking and opening waste fibres. J. D. and C. Tomlinson and J. Porters, Manchester.	2nd Mar.	3,695
Bobbins. H. W. Wilson, Manchester.	4th Mar.	3,755
Belt and band fasteners. T. Chaplin, London.	7th Mar.	4,006
Bobbins and carriages in lace machines. A. Parsons and E. Whitworth, Nottingham.	12th Mar.	4,278
Blowing or steaming, boiling, cooling, scouring, dyeing fabrics. A. T. Clay, Halifax.	15th Mar.	4,514
Breaking and cleaning flax, &c. R. H. Hayward, London.	15th Mar.	4,552
Belting and attachments. T. Cudlipp, London.	19th Mar.	4,795
Breaking or treating flax, &c. A. Spiegelberg, Glasgow.	20th Mar.	4,835
Bleaching, dyeing, &c., raw, spun, or woven fibres. S. Spencer and E. Barlow, London.	20th Mar.	4,865
Carding machine. G. Ebenauer, London.	25th Feb,	3,334
Cutting weft pile fabrics. O. Drey, Manchester.	26th Feb.	3,399
Carding engines (cotton). J. Moorhouse, London.	26th Feb.	3,416
Consuming smoke. J. Kippax, London.	28th Feb.	3,571
Carding engines, &c. E. Edwards, London.	2nd Mar.	3,738
Cutting pile fabrics. J. Wroe, Manchester.	4th Mar.	3,766
Carding engines. J. M. Hetherington, Manchester.	6th Mar.	3,913
Cut-pile fabrics. G. A. J. Schott, Manchester.	6th Mar.	3,914
Cotton seed cleaners. C. Baumgarten, London.	11th Mar.	4,262
Crape ribbon (English). F. Voland, London.	14th Mar.	4,464
Coverings for rollers. J. Shepherd, Stockport.	16th Mar.	4,592
Cutting woven fabrics. G. Smith and J. Grayson, London.	20th Mar.	4,864
Damping warps in looms. J. Savage and J. Challoner, Halifax.	28th Feb.	3,565
Dyeing yarns. H. W. Brown, Glasgow.	1st Mar.	3,639
Driving mechanism for spinning and doubling frames. W. Taylor, Manchester.	2nd Mar.	3,689
Driving bobbins. H. W. Wilson, Manchester.	4th Mar.	3,754
Damping, beating, finishing, drying fabrics. A. and R. Brearley, London.	4th Mar.	3,764
Driving bands. J. Moseley, Manchester.	6th Mar.	3,895
Dyeing and printing. B. Willcox, London.	6th Mar.	3,934
Dyeing (indigo) machine. E. Barlow, Patricroft.	7th Mar.	3,993
Dabbing brushes of combing machines. S. Law and W. Eastwood, Halifax.	12th Mar.	4,272
Drawing-off rollers of gill boxes. J. Radford, Bradford.	14th Mar.	4,431
Driving bands or belts. A. J. Boult, London.	14th Mar.	4,455
Drawing, roving, spinning fancy yarns. I. Briggs, Birmingham.	15th Mar.	4,535
Driving spindles of spinning, &c., machines. J. C. Mewburn, London.	15th Mar.	4,543
Doubling and folding textile material. J. H. Riley, Manchester.	16th Mar.	4,578
Double locker lace machines. H. and W. Boden, London.	16th Mar.	4,614
Drying hanks. C. Turner, Rochdale.	20th Mar.	4,850
Dyeing, bleaching, &c. G. Young and F. Pearn, London.	20th Mar.	4,870
Frame or reel for packing sealskin, &c. G. H. Barraclough, Halifax.	9th Mar.	4,148
Fabrics (animal and vegetable mixed) dyed black. T. Holliday, London.	13th Mar.	4,366
Frogs, single and winged (loom). F. Topp and J. Ashworth, Farnworth.	19th Mar.	4,756
Feeding slivers or fibre to carding engines. W. Lawton, Huddersfield.	19th Mar.	4,758
Grinding card flats. W. Tetley, London.	27th Feb.	3,521
Governing the action of the pattern surfaces of shifting shuttle boxes or of heald motions. T. Marsden and J. Thomson, London.	2nd Mar.	3,690
Guiding textile fabrics and keeping straight when entering machinery. E. Wood, Halifax.	16th Mar.	4,595
Humidifying yarns in cop. J. T. Pearson, London.	26th Feb.	3,392
Hackling machines. A. Coombe, Belfast.	20th Mar.	4,834
Jacquard machines. J. and T. Wilkinson, Bradford.	27th Feb.	3,488
Jacquard cards (using) in parts. W. Cunningham and R. Hutchinson, Dunfermline.	20th Mar.	4,840
Looms. J. Cowburn and C. Peck, Manchester.	28th Feb.	3,544
Looms and stop motions, &c. J. Vickermann, Leeds.	7th Mar.	4,010
Looms (circular). T. Lepage, London.	9th Mar.	4,201
Looms. F. Hebden, London.	12th Mar.	4,317
Lifting and lowering the traversing rails of spinning, &c, machines. J. Boyd, Glasgow.	16th Mar.	4,593
Lingos (loom). D. and M. and A. Sowden, Halifax.	19th Mar.	4,770
Looms. P. M. Sibut, London.	19th Mar.	4,829
Marking on textile fabrics. H. Willey, London.	12th Mar.	4,270
Mules and jennys. J. Gledhill, London.	13th Mar.	4,390
Mounting circles of combing machines. T. Bastow and T. H. Shaw, Bradford.	19th Mar.	4,767
Nozzles and sprinklers. J. H. Rosoman, London.	2nd Mar.	3,742
Operating dabbing brushes. F. Unwin, Bradford.	19th Mar.	4,768
Pile fabrics. S. C. Lister and J. Reixach. London.	26th Feb.	3,455
Pile fabrics—seals or other imitation furs. S. C. Lister and J. Reixach, London.	9th Mar.	4,194
Protecting bobbins in loom shuttles. J. Watson, Leeds.	11th Mar.	4,218
Protecting tubes and bobbins. J. Heginbottom, Oldham.	12th Mar.	4,275
Preventing weft from trailing in looms. A. McIntosh, London.	16th Mar.	4,610
Ring throstle and doubling frames. J. Dickinson, Manchester.	25th Feb.	3,321
Reducing, mixing, and dissolving fibrous materials. J. C. Mewburn, London.	25th. Feb.	3,351
Shuttle guards. U. Greenwood, Halifax.	26th Feb.	3,403
Shuttles. J. and J. Haddock, Manchester.	28th Feb.	3,495
Shedding motions. E. Hollingworth, Huddersfield.	28th Feb.	3,561
Shearing, dressing, drying and beaming warp threads, F. and H. Lucker, London.	1st Mar.	3,680
Shuttle box operating. R. S. Hattersley and J. Hill, Keighley.	6th Mar.	3,909
Shuttle checking and picker preservers. W. H. Teague and T. H. Lindsay, Halifax.	7th Mar.	4,014
Shuttles. E. Duerden and J. Cheetham, London.	11th Mar.	4,232
Shuttle-tip. J. Fallconer, Glasgow.	13th Mar.	4,374
Stretching and brushing sized hanks of fibrous material. W. Fothergill, London.	15th Mar.	4,534
Scutching flax, &c. R. H. Haywood, London.	15th Mar.	4,551
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Patents Sealed.

2,268	2,270	2,281	2,610	2,868	3,020	3,632	4,701
6,763	8,187	8,467	9,145	9,787	16,072	16,150	16,406
16,586	16,756	16,831	16,840	16,869	2,430	2,583	2,642
2,643	2,848	2,871	2,912	2,964	3,039	3,044	3,699
4,054	6,365	9,280	11,110	14,134	15,652	15,953	17,026
17,096	17,268	6,235	17,895	2,838	3,349	3,414	3,553
3,561	3,577	3,781	10,634	14,868	17,347	10,330	654
792	1,357	1,593	3,085	3,206	3,253	3,654	3,683
3,704	3,878	3,885	3,966	4,023	4,218	5,404	10,796
17,271	17,530	17,876	18,151				

Printed for the Publishers by JOHN DALE & CO., 17, *Bridge Street, Bradford, and Published by* HORATIO LORD *and* RICHARD THOMAS LORD, *at* 10, *Ann Place, Little Horton Lane, Bradford.*

The Journal of Fabrics AND Textile Industries.

Vol. 15. No. 93. MAY 12th, 1889. Price 10d.

Contents.

ILLUSTRATIONS.

Notices.

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Readers are invited to forward items of interest to the Trades concerned.

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New Patented Fabrics and Processes.

PILE FABRICS.

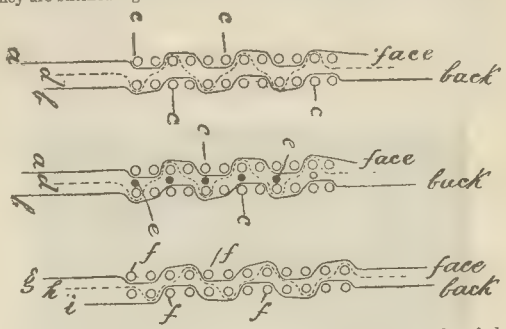
This patent consists of certain improvements whereby, it is claimed that, a useful and effective pile fabric is produced at a reduced cost in time and labour between the weaving and the finishing of the material. Hitherto, pile fabrics have been produced either by a warp varying in quality or material from that of the weft, or, before the piece has been woven, the warp has been sent to the dyer, who has given it such a preparatory colour as he thinks best will suit the colour and the shade that the piece is ultimately to be dyed to match. In this improvement, the warp and weft are of one and the same quality and material, and are dyed to the colour of the piece before being woven in the loom, and, when so woven, it is only necessary to finish the piece, thus the process of dyeing after the piece is woven is dispensed with altogether; by this means, time and labour are saved between the weaving and the finishing of the piece, as compared with the means previously used in the manufacture of pile fabrics.

SCOTCH AND KIDDERMINSTER CARPETS.

This invention has for its objects to lessen the cost and improve the durability of Scotch or Kidderminster carpets and similar flat suface fabrics. This is done by using undyed yarns of various kinds where the natural colours or shades are suitable for the figuring or surface materials. It may be varied either by using a combination of such natural shades for the whole, or a combination in which some dyed shade is introduced to increase the range of effects that may be produced, thus saving in cost of dyeing. The invention also enables materials of a cheaper sort than wool to be employed undyed which are not advantageous to be used in a dyed state on account of the colours fading quickly: the natural colours being practically unfading, the durability of the carpet is thus improved in this respect. In cases in which dyed material is introduced, wool is preferred for the dyed portions, as the colours are faster than on other fibres. Flat surface fabrics are those that are not made with raised loops over wires, as is the case with Brussels carpets, of which the figuring and surface materials consist wholly of warps. Scotch or Kidderminster carpets may be defined as those in which the weft is the figuring material: the warp actuated by the Jacquard causes the changes in the pattern, and, in some cases, is made to contribute slightly to the appearance. There are some kinds, such as Venetian and Dutch carpets, in which the warp is the principle figuring or surface material, the weft contributing but partially to this object. There are several materials cheaper than wool or woollen that may be used undyed—as the natural colours or shades are suitable for the figuring or surface material—such as white cotton, grey cotton, yellow cotton, jute, hemp, China grass, or ramie, and the like, and the patentee utilizes these in his carpets. Bleached white material is classed with dyed, as the cost has been thereby increased, and it is no longer a natural colour or shade. Thus any and various kinds of undyed material of suitable natural colours or shades, or various natural colours or shades of some one material, such as cotton, may be used in any combinations amongst themselves, or a portion in combination with ordinary dyed or bleached materials, or both, as required for the designs and quality to be produced, which any practical manufacturer would know how to arrange. The counts of yarns and process of weaving may be in the ordinary manner.

A NEW FLEXIBLE CLOTH.

An improved method of making the classes of fabrics called twills, hopsacks, diagonals, and such like double or backed cloths, is the subject of a patent which was applied for a few weeks ago. The principal object of the invention is to produce the fabrics in such a manner that, in comparison with those generally made, they shall feel fuller and softer to the touch, and at the same time shall possess more elasticity. One method of manufacture is shown at Fig. 1 in dotted lines at *d*, which represent an additional warp called a tacking warp. In the making of the cloth, the warp *a* is thrown on the face of the fabric, and the warp *b* on the back, thus, two thin fabrics are produced; but, by the employment of the additional or tacking warp *d*, which runs between the two fabrics, they are stitched together as indicated by the dotted lines. The method



of stitching or linking can be varied according to the make of cloth required. In combination with the additional tacking warp, an additional tacking weft thread, as shewn by the black dots *e* in Fig. 2, can be employed, and, instead of making the cloths by means of the additional warp and weft threads as in Figs. 1 and 2, the arrangements of the threads may be reversed, as shewn in Fig 3, where *f* represents the warp, and *g*, *h*, and *i*, the weft, which will be understood by those engaged in making cloths generally, the additional tacking weft thread being indicated by the dotted line *h*. The fabric is called "The New Patent Flexible Cloth."

BLACK DYE ON COTTON.

This patent relates to fixing black dye upon cotton without the use of a mordant, such as a mixture of vitriol and chalk. For this purpose, a decoction of the common heath (*erica* or *calluna vulgaris*) is employed by mixing it with the dye liquor. This decoction has, in a high degree, the property of fixing the dye on the fibres; it renders a special mordanting of the fibre and the subsequent rinsing unnecessary. The active principle contained in the decoction is ericolin, but pure ericolin is not used, as a decoction of erica will produce the desired effect. The process consist substantially in preparing a decoction of the leaves of erica, and mixing it with the dye liquid in proportions depending on the nature of the wool. The following is a good example for 50 kilogrammes of dye liquid: — ½ kilogramme of erica-decoction; 12 kilogrammes of dye-wood extract; 1 kilogramme of copper sulphate (vitriol); 50 grammes of chromate of potash; 50 grammes of borax; 50 grammes of bicarbonate of soda; 1 gramme of cutch or of quercitron. In the dye liquid, the cotton is heated for two hours, then slowly separated, left by itself for about two two days, then finally rinsed. With this treatment, the rinsing water is not appreciably polluted, and it is claimed that a colour is obtained which resists sunlight.

PREVENTING THE DECOMPOSITION OF SIZE OR FINISHING FOR COTTONS, &c.

In the manufacture or finishing of cotton, linen, and other fabrics, paper, skins and other tissues, it is customary to incuperate into them a stffening or thickening material, such as starch, dextrin, natural gum, gelatine, algin or size. All these materials are prone to decompose and produce offensive products, or they allow of the formation of mould when they are exposed, for example, to warm moist air not specially sterilised. When brought into contact with the person—as, for instance, on an article of clothing—they afford, as is well known, a very suitable soil for the development of the germs of specific diseases. In order, therefore, to prevent or arrest the growth or development of such germs or infectious matter, with the finish, priming, thickening or stiffening material, a certain proportion of a suitable mixture capable of effecting the purpose indicated, while not injuring the useful properties of the said materials, is mixed. The mixture employed contains quadriborate of soda and salicylate of soda or other quadriborate or salicylate soluble in water, but ordinarily the soda salts are preferred. A convenient proportion is forty parts of quadriborate to one part of salicylate, which quantities are usually sufficient for one thousand parts of solid gelatine size or the the like, prior to solution. However, these proportions may be varied. One advantage of this mixture is that, when brought in contact with living skin, the acid of the perspiration liberates from it salicylic acid, a very valuable disinfectant. Again, the same liberation of salicylic acid will usually occur on wall papers when this mixture has been added to the size, because the atmosphere of a room where gas is burned is always acid with sulphuric acid. The mixture may be incorporated with the thickening material in any convenient manner, by dissolving it either alone or conjointly therewith in warm water and stirring well together.

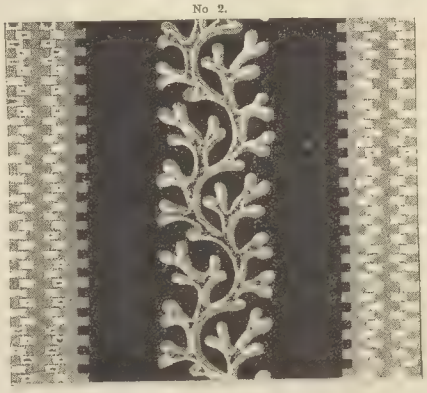
New Designs in Fabrics.

Under this heading, we gave a few designs for dress fabrics in our last issue, as well as a variety of ideas for the colouring of them. We again desire to draw the attention of our readers to the demand which seems to be increasing for fabrics of an ornamental nature, and, as the best means of doing so, we give a few specimen patterns worthy the attention of manufacturers of dress goods. In the first place, we wish it to be understood that the designs are to be woven larger than shown below, but their exact size we prefer to leave to manufacturers to determine according to the requirements of each. The first pattern (No. 1.) is of an ornamental description—the ground is black, with white

No. 1

and pale and dark reddish brown working upon it, with narrow black and white stripes running down each side. These stripes can be increased to any number as may be desired. The design may also be woven with pale gold and pale and dark reddish brown upon a light pink ground, with the narrow stripes in pink and white. This is intended as a design for a border, but it is very well adapted for a striped dress fabric, any required number of plain stripes intervening between the ornamental ones. Another design which we give (No. 2) is quite as suitable for a striped dress fabric as for a border only. It consists of a running band of coral in white and pink on a black or other dark ground. In this case, a good margin of the ground colour is shown on each side the coral, this in its turn being bordered by narrow stripes of pink and white, which, as in the first pattern, may be increased as desired. Another effect may be given to the pattern by substituting a primrose colour for the black ground, or any other light shade of ground would be suitable, providing the coral shows distinctly upon it. A good border could be made by repeating this pattern two or three times, finishing off each side with about a dozen plain stripes, and about half a dozen intervening between each stripe of coral—a remark which applies equally to No. 1 as a border, although this should really be much enlarged, in which case the single pattern, as shown in the illustration, will be amply sufficient as a border. No. 3 is a border for two colours,

No. 2.



either for dark or light shades, and would be best woven in its present size, about four repeats of the pattern going to make up a good border. There is another purpose for which these patterns are suitable—namely, for the ribbon trade, for such are much in favour at the present time. They are also well adapted for printed fabrics, more particularly for cotton dress materials. The present fancy for highly ornamented cloths of all descriptions carries one back to the times of a generation ago when much the same taste was shown as appears to prevail at the present time in stuffs, silks, velvets, and cotton and other goods. Of course, this is well known, and we merely mention it as we have lately been looking up some of the fabrics woven thirty or more years since, which, with the ruder appliances then in use, and technical education, in the present sense of the term, unknown, appear to us to almost equal anything made at the present time. It is difficult to properly illustrate elaborate designs in the pages of a journal, or we should have been pleased to have produced *fac-similies* of one or two of these patterns. We have, however, selected two of the most simple ones, which we illustrate, and, curiously enough, the taste shown at the present for every shade of green is a repetition of that displayed at the time these two

No. 3.

were woven. No. 4 has stripes and flowers of green varied with a lace stripe in black upon a cream ground. No. 5 has leaves in shaded green and gold on a cream ground, with dotted stripes of light green. They are quite worth the attention of manufacturers of this day, and, being simple patterns, are suited for almost any colouring, and are also well adapted as all-over patterns for dress fabrics in either silk or woollen. We have another pattern for bordered dress fabrics, made no one knows how long ago, but it is equal to anything in finish, workmanship, and elaborateness of design, we have yet seen in modern productions. It is in the Indian style, has several colours and is similar in effect to that of the old Paisley shawls once so much in favour. In our last article, we spoke of the German dress goods in the English warehouses. Since then, *Kuhlow's German Trade Review and Exporter* has given some interesting news, from which we learn that robes put up in card-board boxes are being made for next winter, in forms which differ completely from previous arrangements. The clothing stuff manufacturers will supply, for that season, the stuffs, likewise with the fur trimmings, which are very fashionable. The whole arranged in a box as stated presents an effective appearance, and may be considered a very interesting novelty. Single coloured cloth stuffs, in

lengths of eight to nine metres, are placed in a card-board box, with stamped cloth flounces, under which suitable fur trimming is arranged. These cloth flounces are in such lengths as to admit of their going three times round the skirt of the dress underneath, they can also be used as bodice trimmings The whole is arranged

No. 4.

in such a manner that, in opening the box on the upper side, the three narrow striped flounces with the fur trimming prettily draped on the clothing stuff, presents a striking appearance. With each set, a fashion picture is given, in which the way to make the dress is made clear. We saw red cloth stuffs arranged with grey or nutria fur stripes, and also bluish-grey cloth stuffs with fur stripes. Another sort of robe in a card-board box has the front of the skirt of a woollen dress stuff richly embroidered, and with embroidered stripes, which is intended as an ornament for the garment. There is another very pretty sort of cloth dress stuff, with cloth appliqué, it consists of stripes stamped with iron to form floral and arabesque patterns. The borders are surrounded with cord stitches in variegated silk. These cloth appliqués, which are made of the stuff for the garment, accompany each robe in a suitable quantity. Another kind of card-board box robe combines single coloured stuffs for

No. 5.

the dress and for the bodice with material of large square designs. These robes offer many surprises, they contain woollen upper-stuffs, and square dress-stuffs in silk, or, what appears to be still more recent, in velvet. Variegated large-square velvet stuffs made for dresses were shewn to us as card-board box robes, in combination with single colour cashmere or fine cloth stuffs. Another sort of robe consists of fringe dresses. These are mostly in Scotch plaid kinds of dress stuffs, at the edge of which woollen fringe of a hand's breadth is attached. When the dress stuff is well draped, this fringe falls as an elegant trimming on the skirt, which it goes round. We saw these fringe dresses even tolerably richly ornamented, much attention being given to the fringes. They have tassels, mixed with longish acorns, also gold cord and gold tassels. The fringes, which lie richly on the square ground on the front side of the dress, in two or three circles, in such robes, are very conspicuous. The robes are mostly in dark green Scotch colours. A very striking effect is attained with gold fringe mingled with Scotch cord fringe.

Tariff Changes and Import Duties.

FOREIGN IMPORT DUTIES ON COTTON YARNS.

The following statement, which shows the rates of Customs duty levied in each of the undermentioned countries upon the importation of Cotton Yarns and Thread from the United Kingdom, has been prepared in the Department for publication in the *Board of Trade Journal*.

NOTE.—Since the publication of the return relating to Foreign Import Duties (178/85), numerous modifications have been effected in Customs Tariffs of various foreign countries; these modifications, in so far as regards Cotton Yarns and Thread, have been embodied in the following statement :—

Tariff Classification in each Country.	Rates of Duty.		English Equivalents.			
		Rbls. Cop.		£	s.	d.
RUSSIA :—						
No. 45, English, and below :—						
Unbleached	Poud	3·60	Cwt.	1	15	6
Bleached and dyed (except Turkey red)	,,	4·70	,,	2	6	4
Dyed Turkey-red	,,	5·00	,,	2	9	3
Above No. 45 :—						
Unbleached	,,	5·00	,,	2	9	3
Bleached and dyed	,,	6·00	,,	2	19	1
Sewing and knitting thread of all sorts, prepared for retail sale	,,	6·00	,,	2	19	1
Twisted yarns, of two or more threads	,,	7·00	,,	3	9	0
		Kron. Öre				
SWEDEN :—						
Single or double, undyed	Kilog.	0·20	Cwt.	0	11	3½
,, dyed or printed, of all kinds	,,	0·35	,,	0	19	9
Sewing thread	,,	0·40	,,	1	2	7
		Kron. Öre				
NORWAY :—						
Undyed, not twisted	Kilog.	0·07	Cwt.	0	3	11½
,, twisted	,,	0·14	,,	0	7	11
Other kinds	,,	0·20	,,	0	11	4
		Kron. Öre				
DENMARK :—						
Undyed	Pund	0·06½	Cwt.	0	7	1
Dyed or mixed with metal threads	,,	0·16⅝	,,	0	18	10
		Mks. Pf.				
GERMANY :—						
Pure or mixed with flax, wool, silk, or hair :—						
Single, unbleached :—						
Up to No. 17, English	100 kilos.	12·00	Cwt.	0	6	1
From No. 17 to No. 45	,,	18·00	,,	0	9	2
,, No. 45 to No. 60	,,	24·00	,,	0	12	2
,, No. 60 to No. 79	,,	30·00	,,	0	15	3
Above No. 79	,,	36·00	,,	0	18	4
Double, unbleached :—						
Up to No. 17, English	,,	15·00	,,	0	7	7
From No. 17 to No. 45	,,	21·00	,,	0	10	8
,, No. 45 to No. 60	,,	27·00	,,	0	13	9
,, No. 60 to No. 79	,,	33·00	,,	0	16	9
Above No. 79	,,	39.00	,,	0	19	10
Single or double, bleached or dyed :						
Up to No. 17, English	,,	24·00	,,	0	12	2
From No. 17 to No. 45	,,	30·00	,,	0	15	3
,, No. 45 to No. 60	,,	36·00	,,	0	18	4
,, No. 60 to No. 79	,,	42·00	,,	1	1	4
Above No. 79	,,	48·00	,,	1	4	5
Three or more threads, unbleached, bleached, or dyed	,,	48·00	,,	1	4	5
Cable twist, unbleached, bleached, or dyed; also sewing thread of all kinds prepared for retail sale	,,	70·00	,,	1	15	7
HOLLAND :—						
All kinds	Free.		Free.			
		Frs. Cts.				
BELGIUM :—						
Unbleached or bleached						
Single or twisted :—						
Of 20,000 metres or less to the half-kilogramme	100 kilos.	15.00	Cwt.	0	6	1
From 20,000 to 30,000 metres do.	,,	20·00	,,	0	8	2
,, 30,000 to 40,000 metres do.	,,	30·00	,,	0	12	2
,, 40,000 to 65,000 metres do.	,,	40·00	,,	0	16	3
Above 65,000 metres do.	,,	10·00	,,	0	4	0½
Dyed or warped :—						
Single or twisted						
Of 20,000 metres or less to the half-kilogramme	,,	25·00	,,	0	10	2
From 20,000 to 30,000 metres do.	,,	30·00	,,	0	12	2
,, 30,000 to 40,000 metres do.	,,	40·00	,,	0	16	3
,, 40,000 to 65,000 metres do.	,,	50·00	,,	1	0	4
Above 65,000 metres do.	,,	10·00	,,	0	4	0½
(*Note.*—Cotton yarns mixed with other materials will pay as cotton yarns, provided the cotton predominates in weight.)						

		Frs. Cts.		£ s. d.
FRANCE :—				
Single unbleached :—				
Of 20,500 metres or less to the half-kilogramme	100 kilos.	15·00	Cwt.	0 6 1
From 20,500 to 30,500 metres	do.	20·00	,,	0 8 2
,, 30,500 to 40,500 metres	do.	30·00	,,	0 12 2
,, 40,500 to 50,500 metres	do.	40·00	,,	0 16 3
,, 50,500 to 60,500 metres	do.	50·00	,,	1 0 4
,, 60,500 to 70,500 metres	do.	60·00	,,	1 4 5
,, 70,500 to 80,500 metres	do.	70·00	,,	1 8 5
,, 80,500 to 90,500 metres	do.	90·00	,,	1 16 7
,, 90,500 to 100,500 metres	do.	100·00	,,	2 0 8
,, 100,500 to 110,500 metres	do.	120·00	,,	2 8 9
,, 110,500 to 120,500 metres	do.	140·00	,,	2 16 11
,, 120,500 to 130,500 metres	do.	160·00	,,	3 5 0
,, 130,500 to 140,500 metres	do.	200.00	,,	4 1 3
,, 140,500 to 170,500 metres	do.	250·00	,,	5 1 7
Above 170,500 metres	do.	300·00	,,	6 1 11
Do., bleached	15 °/₀ above the duty on single, unbleached, according to class.			
Do., dyed or clouded	25 centimes per kilog. (10s. 2d. per cwt.) above the duty on single, unbleached, according to class.			
Twisted, in two or three strands, unbleached :—				
Of 20,500 metres or less to the half-kilogramme	100 kilos.	18·00	Cwt.	0 7 4
From 20,500 to 30,500 metres	do.	24·00	,,	0 9 9
,, 30,500 to 40,500 metres	do.	36·00	,,	0 14 8
,, 40,500 to 50,500 metres	do.	48·00	,,	0 19 6
,, 50,500 to 60,500 metres	do.	60·00	,,	1 4 5
,, 60,500 to 70,500 metres	do.	72·00	,,	1 9 3
,, 70,500 to 80,500 metres	do.	84·00	,,	1 14 2
,, 80,500 to 90,500 metres	do.	108·00	,,	2 3 11
,, 90,500 to 100,500 metres	do.	120·00	,,	2 8 9
,, 100,500 to 110,500 metres	do.	144·00	,,	2 18 6
,, 110,500 to 120,500 metres	do.	168·00	,,	3 8 3
,, 120,500 to 130,500 metres	do.	192·00	,,	3 18 0
,, 130,500 to 140,500 metres	do.	240·00	,,	4 17 6
,, 140,500 to 170,500 metres	do.	300·00	,,	6 1 11
Above 170,500 metres	do.	360·00	,,	7 6 4
Do., bleached	15 °/₀ above the duty on twisted, unbleached, according to class.			
Do., dyed or clouded	25 centimes per kilog. (10s. 2d. per cwt.) above the duty on twisted, unbleached, according to class.			
Warped yarns, unbleached	30 °/₀ above the duty on yarns of which composed.			
Do., bleached	15 °/₀ above the duty on warped, unbleached.			
Do., dyed	25 centimes per kilog. (10s. 2d. per cwt.) above the duty on warped, unbleached.			
Yarns of four or more threads unbleached, bleached or dyed :—		Frs. Cts.		
Single twist	1,000 metres of single yarn.	0·015	1,000 yds. of single yarn.	0·13
Double or cable twist	,,	0·02	,,	0·18
Thread in balls or on reels, cards, &c., of all kinds, unbleached, bleached, or dyed :—				
Single twist	,,	0·02	,,	0 0 0·18
Double or cable twist	,,	0·025	,,	0 0 0·22
PORTUGAL :—		Reis.		
Single, unbleached, dyed flesh-colour, or stamped with more than one colour	Kilog.	*135·00	Cwt.	1 10 10
Do., bleached	,,	235·00	,,	2 13 9
Do., dyed, not otherwise specified	,,	270·00	,,	3 1 9
Twisted, unbleached, bleached, or dyed	,,	370·00	,,	4 4 7
SPAIN :—				
Single or double, unbleached, bleached, or dyed :—		Pes. Cts.		
Up to No. 35, English, inclusive	Kilog.	0·76	Cwt.	1 10 11
No. 36, English, and above	,,	1·00	,,	2 0 8
Twisted, of three or more threads, unbleached, bleached, or dyed	,,	1·75	,,	3 11 2
ITALY :—		Lire Cts.		
Single, unbleached :—				
Of not more than 10,000 metres to the half-kilogramme	100 kilos.	18.00	Cwt.	0 7 4
From 10,000 to 20,000 metres	do.	24·00	,,	0 9 9
,, 20,000 to 30,000 metres	do.	30·00	,,	0 12 2
,, 30,000 to 40,000 metres	do.	36·00	,,	0 14 8
,, 40,000 to 50,000 metres	do.	45·00	,,	0 18 3
,, 50,000 to 60,000 metres	do.	52·00	,,	1 1 2
Above 60,000 metres	do.	60·00	,,	1 4 5
Do., bleached	20 °/₀ above the duty on single, unbleached, according to class.			

* In addition to this rate, a tax of 3 °/₀ upon the duty is payable for Custom House fees, and a further 2 °/₀ *ad valorem* for harbour works, which would raise the total duty payable to about 150 reis per kilogramme.

		Lire Cts.		£ s. d.
Single, dyed	25 lire 00 c. per 100 kilos. above the duty on single, unbleached, according to class.			
Twisted, unbleached, bleached, or dyed (*Note.*—The classification of twisted yarns is determined by multiplying the length by the number of threads twisted.)	As the single yarns of which composed, unbleached, bleached, or dyed, with 17 lire 00 c. per 100 kilos. additional.			
Warped yarns	15 °/₀ above the duty on the yarns of which composed.			
Sewing thread wound on reels, in balls, and the like, prepared for retail sale	100 kilos.	110·00	Cwt.	2 4 8
AUSTRIA :—		Fls. Kr.		
Single, unbleached :—				
Up to No. 12, English	100 kilos.	6·00	Cwt.	0 6 1
From No. 12 to No. 29, English	,,	8·00	,,	0 8 2
,, No. 29 to No. 60, English	,,	14 00	,,	0 14 3
Above No. 60, English	,,	12·00	,,	0 12 2
Double, unbleached :—				
Up to No. 12, English	,,	8·00	,,	0 8 2
From No. 12 to No. 29, English	,,	10 00	,,	0 10 2
,, No. 29 to No. 60, English	,,	16·00	,,	0 16 3
Above No. 60, English	,,	12·00	,,	0 12 2
Single or double, bleached, or dyed :—				
Up to No. 12, English	,,	12.00	,,	0 12 2
From No. 12 to No. 29, English	,,	14·00	,,	0 14 3
,, No. 29 to No. 50, English	,,	18·00	,,	0 18 4
Above No. 50, English	,,	20·00	,,	1 0 4
Twisted, of three or more threads, unbleached, bleached, or dyed	,,	24·00	,,	1 4 5
Yarns prepared for retail sale	,,	35·00	,,	1 15 7
(*Note.*—Yarns of cotton mixed with linen pay as cotton yarns.)				
SWITZERLAND :—		Frs. Cts.		
Single, unbleached	100 kilos.	6·00	Cwt.	0 2 5½
,, bleached	,,	8·00	,,	0 3 3
Twisted, unbleached, or bleached	,,	8·00	,,	0 3 3
Dyed yarns, single or double	,,	11.00	,,	0 4 5½
,, of three or more threads	,,	35·00	,,	0 14 3
In spools, balls, or skeins, prepared for retail sale	,,	35·00	,,	0 14 3
GREECE :—		Drs. Lep.		
Single, unbleached :—				
Up to No. 24, English	Oke	0·60	Cwt.	0 19 2
Above No. 24, English	,,	0·80	,,	1 5 7
Single, bleached :—				
Up to No. 24, English	,,	0·66	,,	1 1 0
Above No. 24, English	,,	0·88	,,	1 8 2
Single, water dyed :—				
Up to No. 24 English	,,	0·80	,,	1 5 7
Above No. 24 English	,,	1·04	,,	1 13 3
Single, oil dyed, irrespective of No.	,,	1·50	,,	2 8 0
Twisted yarns and cable twist	20 °/₀ above the duty on single yarns according to class.			
Sewing thread, white, or coloured	Oke	1.50	Cwt.	2 8 0
TURKEY :—				
All kinds	8 °/₀ *ad val.*		8 °/₀ *ad val.*	
ROUMANIA :—		Lei. B.		
Single, carded, unbleached or bleached	100 kilos.	15·00	Cwt.	0 6 1
Twisted, in two or more threads, unbleached, or bleached	,,	20·00	,,	0 8 2
Dyed yarns, single or twisted	,,	45·00	,,	0 18 3
Sewing thread	,,	60·00	,,	1 4 5
UNITED STATES :—		Dols. Cts.		
Thread or yarn not on spools, single or twisted :—				
Value not exceeding 25 cent per lb.	Lb.	0·10	Cwt.	2 6 8
,, from 25 cents to 40 cents ,,	,,	0·15	,,	3 10 0
,, from 40 cents to 50 cents ,,	,,	0·20	,,	4 13 4
,, from 50 cents to 60 cents ,,	,,	0·25	,,	5 16 8
,, from 60 cents to 70 cents ,,	,,	0·33	,,	7 14 0
,, from 70 cents to 80 cents ,,	,,	0·38	,,	8 17 4
,, from 80 cents to 1 dollar ,,	,,	0·48	,,	11 4 0
,, exceeding 1 dollar ,,	50 °/₀ *ad val.*		50 °/₀ *ad val.*	
Yarn on spools containing on each spool not more than 100 yards of thread	Doz. spools	0·07	Doz. spools.	0 3½
Do., if exceeding 100 yards of thread, for every additional 100 yards or fraction thereof	,,	0·07	,,	0 3½

The firm of Galloway and Sons, Manchester, so well known as makers of the Galloway boiler and compound and other steam engines, have converted the firm into a limited liability company, under the name of Galloway's, Limited. We may here mention that the firm have been awarded the first order of merit at the Melbourne Exhibition.

TARIFF CHANGES AND CUSTOMS.

SWITZERLAND.—Cops (small paper tubes for the distribution of the yarn in self-acting looms). Duty, 16 francs per quintal.

Note.—Franc=$9\frac{1}{2}$d. Quintal=220·4 lbs. avoirdupois.

SPAIN.—Jute yarn, twisted, with four ends. Duty, 18 pes. 90 cs. per 100 kilogrammes. Soap for household and industrial uses, but not adapted for the lubricating of machinery. Duty, 1 pes. per 100 kilogrammes. Oilcloth in patterns pays duty similarly as tissue, felt, or carpets.

Note.—Kilogramme = 2·204 lbs. avoirdupois. Peseta=$9\frac{5}{12}$d.

TURKEY.—With the object of promoting the erection of new factories in Turkey, the Ottoman Government is prepared, during a period of 15 years, to admit duty-free such machines and tools as are required for fitting up a factory, worked by steam or other power. Those manufacturers who desire to avail themselves of this concession must state to the customs authorities the number and sort of such machines or tools.

MOROCCO.—*Import Duty.*—Articles of any origin pay an import duty of 10 per cent. *ad valorem*. *Export Duty.*—Cord, twine, &c., 100 kilos. 9·84; camel's hair, 100 kilos., 7·88; oil, 100 kilos., 12·30; wool, 100 kilos., 19·68; scoured wool, 100 kilos., 13·44.

Note.—Kilogramme=2·204 lbs. avoirdupois. Franc=$9\frac{1}{2}$d.

ARGENTINE REPUBLIC.—The Board of Trade have received information to the effect that the Customs duty on the importation of shoddy and goats' hair blankets, whipped or bound, into the Argentine Republic, has been reduced to 25 per cent *ad valorem*.

	Gaboon stalks and fibres for working	Free.
YARNS.	Yarns of linen, hemp, and cotton	10 per cent. *ad val.*
	Do. of wool and silk	10 „ „
TISSUES.	Tissues, unbleached, of linen, hemp, and cotton	10 „ „
	Do. of wool	10 „ „
	Do. of silk	10 „ „
	Do. of jute	10 „ „
	Do., dyed or printed, pay an additional duty of	10 „ „
	Haberdashery of all kinds, with the exception of haberdashery of fine gold or silver	10 „ „
		Frs. Cts.
	Sacks (including those intended for the exportation of native products)	Each 0·02
	Ready-made clothing (including linen made up)	10 per cent. *ad. val.*
	French machinery	Free.
	Foreign do.	10 per cent. *ad. val.*
	Felts and manufacture of felt, other than hats	100 kilos. 20·00

THE TARIFF ON WORSTED IN THE UNITED STATES OF AMERICA.

A controversy which has for some time past been carried on, between American importers of worsted fabrics and the American manufacturers, as to whether worsted fabrics should pay the duty specifically imposed on them by the tariff, or the other and higher duty which the law imposes on woollens, is attracting a larger share of public attention than is usually given to a trade dispute. According to the New York "Commercial Bulletin," this is not wholly due to the importance of the question at issue. Many other interests affected by the tariff are awaiting the action of the Secretary of the Treasury, in this case, as an indication of the policy of the new Administration in dealing with disputed Customs questions. It is the prevailing opinion that if the Department yield in this instance to the wishes of those who are urging the assessment of higher duties, it will afford evidence that many other decisions will follow, similarly affecting other classes of imports. The importance of the woollen and worsted question has not diminished in the light of discussion; on the contrary, it has been clearly shown that a change of practice at this time by Treasury ruling would be far-reaching in its disturbing and injurious influences, and that, from a business point of view, it would be desirable to allow Congress to settle a question of so much commercial importance. The discussion has shown a variety of opinions, but it has not affected the actual merits of the case. The fact remains that the tariff, besides making a definite provision for woollen cloths, also makes a separate and distinct provision for manufactures of worsted, and prescribes for them a different and lower rate of duty. Many more or less relevant things are said about the sections in which these two provisions appear about anomalies and inconsistences, and about the hopeless confusion of the tariff; but after all has been said, these two clauses remain in the law, and cannot be ruled out by a Treasury decision. The lower rate prescribed for manufactures of worsteds remains just as binding on administrative officers as the higher rate prescribed for manufactures of woollens. In this discussion, many interesting points have been made and many questions raised, that can properly be submitted to Congress, to sustain the claim that no discrimination should have been made between woollens and worsteds, but they do not serve to prove that such a discrimination was not made by the framers of the law. It has been claimed that the Secretary of the Treasury should decide the question in favour of the manufacturers under the following provision of the tariff:—"If two or more rates of duty should be applicable to any imported article, it shall be classified for duty under the highest of such rates." This provision is not pertinent to the dispute. The tariff undertakes to provide specifically or by definite class for all varieties of imports, and in order to cover omissions and cases of doubtful classification, it gives a general rule for cases where an article has not been enumerated at all, or where it appears to come equally well under either of two classifications, and the authorities may be in doubt as to which was intended. The clause quoted can only apply to such cases. If the tariff has made specific provision for all manufactures of worsteds, it is to this, and to this provision only, that they are subject.

Ober Sizing and the Steaming of Weaving Sheds.

For some months past, there has been considerable agitation amongst the leaders of the Operative Unions and the operatives themselves anent the over sizing of warps and the steaming of weaving sheds, with the result that a joint committee of representatives of the House of Commons and of the operatives commenced to sit on the 6th inst., their object being to sift this important subject. No doubt, the question will be thoroughly ventilated during the next few weeks, and means suggested to mitigate or to overcome any evil effects of over sizing and steaming of cotton warps. The members of the joint committee are:—Sir W. H. Houldsworth, M.P., Lord Cranbourne, M.P., Sir Henry James, M.P., Sir Henry Roscoe, M.P., A. J. Mundella, Esq., M.P., T. T. H Sidebottom, Esq., M.P., Isaac Hoyle, Esq., M.P., and the following operatives' representatives:—Mr. J. Mawdsley, J.P., Manchester; Mr. T. Birtwistle, J.P., Accrington; Mr. John Fielding, J.P., Bolton; Mr. David Holmes, Burnley, Mr. George Barker, Blackburn; Mr. H. A. Cottam, Blackburn; and Mr. George Silk, Oldham. Sir U. Kay-Shuttleworth, M.P., who is taking a leading part in the question, visited the mill of Messrs. Thornber Bros., Burnley, a few days ago, to inspect the appliances used in the moistening of the atmosphere for the purposes of facilitating the weaving of certain kinds of cloth. Mr. C. Thornber conducted the visitor over the premises, and pointed out that the object of the patented apparatus used in the mollification of the warps was to show that it could be achieved without detriment to the health of the operatives. The opinion of the gentleman of the merits of the apparatus will probably be given before the committee. With respect to the various kinds of mechanisms recently introduced for moistening the atmosphere and the cloth, we gave a short time ago lengthy descriptions of those patented by Messrs. Newell and Stone of Farnsworth, Bolton, and also of those of Mr. J. White, Ellis Street, Burnley. The latter acts directly upon the warp beam, the steam condensing upon the warp in any required quantity. In actual practice, it has been found thoroughly efficient, and weavers who have the apparatus fixed to their looms have quickly found out its advantages, and speak highly of it in every respect. No doubt, the merits of Mr. White's invention will be put before the committee, as will those of others who claim for their mechanism that it will do away with any objectionable steaming, and at the same time allow of a reasonable quantity of size being used upon cotton warps. It seems the steaming question has been a cause of trouble in other countries. Mr. James Donochie, engineer, San Lorenzo Nogoalis, Orizaba, Estado de Vera Cruz, Mexico, writes as follows:—"Will you allow me, through the columns of your interesting and valuable paper, to let the cotton manufacturers know I have an arrangement that would do away with the blowing of steam into their weaving sheds or rooms. My plan would answer the purpose much better. They would produce cloth equally as good, and very little of the heavy sizing would fall off. Steaming and heavy sizing are both very unhealthy and disagreeable to the weavers, and to all that are employed in weaving, where such things are used under the present arrangements. My opinion is that many of the serious accidents caused by the flying out of the shuttle results from the condensing of steam on the lathes of the looms, causing them to twist and get out of line. The weaver can neither produce quality nor quantity, and it causes the machines to run much heavier. My system can be applied to card room machines and spinning. In this country, we are much troubled with the hot south winds, which are bad for spinning and weaving, and are the cause of a great deal of sizing falling off the warps. In my opinion, this system should be adopted in all countries where cotton manufacturing is carried on. For this reason, I should like to secure it in England and all countries where cotton goods are made. My system would do away with the blowing of steam into weaving sheds or rooms, and could be applied to all the different weaving places at a very small cost." Unfortunately Mr. Donochie does not give us an idea of what his plan for mitigating the evil consists, or steps might be taken to introduce his method into this country.

Sir E. J. Monson, Her Majesty's Minister at Athens, says the Greek Government has submitted to the Chamber a Bill for the protection of trade marks, based upon the laws in force in other European countries. The protection is to last for 10 years. The same Bill contains provisions enabling the Government to conclude advantageous commercial conventions with foreign countries in connexion with the protection thus afforded to articles of foreign manufacture.

Original Designs.

On our first plate, we give a design for either a Lace or a Tapestry Curtain, and, in either case, it may be produced without the dado. This is probably one of the best designs which we have placed before our readers.

* * * *

On our second, we give a pattern of a Printed Blind, which should be enlarged for the purpose of making a really effective pattern.

* * * *

On our third is a design intended for Printed Muslin for Curtain and other purposes. This should be produced about double the size shown on our plate. The second and third designs have been drawn by Mr. R. Lord, 10, Ann Place, Bradford.

Monthly Trade Reports.

WOOL.—At the sale in London, a large quantity of wool has passed the hammer at firm rates, the biddings generally having been brisk, and there is a prospect that the present high prices will continue to the finish of the sales. In the Bradford district, woolstaplers have not been able to secure an advance of rates in proportion to those in London, and where higher prices have been demanded it has stopped business. Wool has generally been bought during the month for actual consumption, buyers only purchasing in large lots where an advantage in price could be gained. The yarn trade has shown no new features, spinners complaining much of the low rates offered for new orders—any attempt at higher prices being checked immediately. The export branches have improved slightly, orders having been given out more freely than usual. The piece trade has kept fairly good, the run being chiefly upon goods of a fancy character, and also upon fabrics of a soft nature. Prices have in these classes kept very firm.

COTTON.—The markets in nearly all branches of the cotton industry have, during the month, been in a rather unsettled state. The raw material, as usual, has been the disturbing element. After fluctuating in rates, a rise of from ¼d. to 1d. per lb. has been established, and this has had its effect on both the spinning and weaving branches. Spinners have generally advanced their prices, and have invariably refused to sell unless an advance has been given; this has, in a measure, curtailed business, and the sales have, consequently, fallen off. The Continental trade has improved slightly, but, on the contrary, that with China and Japan has been quieter, and stocks for these markets have begun to accumulate, to the great uneasiness of producers. In the cloth branches, manufacturers have asked firmer rates, but without much success, as merchants refuse to place orders at advanced prices. There has been an improved demand for India and China. Wide shirtings have sold rather freely, and manufacturers of these are, at present, very independent in their dealings. The home trade has been fair, and values have generally kept firm. Both spinners and manufacturers look upon the immediate future as rather unpromising; the hardening prices of the raw material interferes much with their markets, as it seems out of the question that they can secure prices proportionate to the advance.

WOOLLEN.—In the various districts devoted to the woollen industries, with few exceptions, trade has been fairly good. The run on fine worsteds of fancy and plain kinds still continues, and, judging by the number of orders taken from the new patterns recently shewn, there will be a busy time amongst manufacturers of these goods for some time. The same cheerful outlook pervades the manufacturing branches of various kinds of tweeds, Cheviots, &c. In fancy fabrics of the lower qualities adapted to the clothing trade, some really good patterns have brought orders freely, and this branch is likely to be busy for some months. In the large variety of patterns of a fancy nature, the makers have made as usual a great advance this season on goods produced twelve months ago, the general get-up being much improved.

LINEN.—With the exception of a falling off during the Easter holidays, trade in linens has been fairly good, whilst the prospects for the future are more hopeful. The demand for the better qualities has been rather quiet, orders for this class of fabrics not having come to hand easily, but the lower qualities have been in fair request, and the same may be said of drills, bed linens, sheetings, &c. In domestic cloths there has been more doing, and manufacturers of this class are well off, as far as regards orders, for some little time. Prices for the latter have been harder, but for other goods there is little improvement to note in this respect.

LACE.—This trade has been rather quieter than was the case last month, although it has proved much better than during the corresponding period of last year. The curtain branch has kept fairly well employed, still, in this department, there is much room for amendment. A steady business and an improved inquiry have characterised the cotton lace branches, whilst edges and trimmings have been in fair request. Manufacturers still complain of the very small profits procurable in any part of the industry, and although novelties are repeatedly put upon the market, the return for outlay of patterns, &c., is inadequate. Silk goods are just now having a good run, the probability being that a successful trade will be done in these during the summer.

The Dresden Export Museum.

The following is an extract from a report by Mr. G. Strachey, Her Majesty's Chargé d'Affaires at Dresden, on the subject of the proceedings of the Dresden Export Museum:—"The manager of the Dresden Export Museum reported some time since on the affairs of that institution, which has for its object the promotion of the foreign trade of this kingdom and the adjacent Thuringian principalities. The society has recently printed 10,000 copies of a directory drawn up in English, entitled 'Guide to the Export Industry of Saxony and Thuringia,' also an illustrated 'Album of Saxon Establishments,' turned out in artistic ornamental style. These works are described as intended to facilitate German competition in English-speaking countries; they have been forwarded to German commercial clubs abroad, and will be otherwise brought under public notice in suitable places. There has, further, been printed a catalogue of the foreign natural and industrial products collected by the Museum, which now numbers 500 articles. In 1887-88, the Museum received 600 orders, double the number given in the previous year. The correspondence reached the number of 10,000 letters, and there were despatched besides 12,000 printed circulars. Last year, the society sent a traveller to Montreal, and another agent visited the West Coast of America with a collection of samples. These persons were to study the local markets, report on their requirements, and collect samples. The Canadian traveller proceeded *via* the United States, Mexico, the West Indies, and South America. Mention is made of the fact that a suitable cabin was given him, gratis, in a steamer of the Bremen-Lloyd Company. The newspapers have just reported that two additional travellers have now left for the American continents, one of whom has taken with him a considerable supply of goods for exhibition in the Argentine Republic and on the coast of the Pacific. The report states that the German consulate in the Corea, has forwarded to the Museum a set of local export and import samples. It is mentioned that the principal staple of foreign imports to the peninsula is heavy, unbleached, English cotton goods in particular, smooth shirtings at from £10 16s. to £12 the piece, likewise, linen, muslins, and Russian cloth, the last being received from Germany. Some of the other German export museums have received official subsidies. The funds of the Dresden enterprise are entirely derived from private sources; but the Museum is lodged in a building placed at its disposal by the Saxon Government."

Bombay Technical School.

The Bombay papers bring full reports of the proceedings on the occasion of the recent formal opening of the Jubilee Technical Institute in that city by Lord Reay. The Institute owes its initiation to a growing feeling that the educational movement in India had taken a too classical turn, with the result that the supply of educated clerks was beginning to exceed the demand, while that of technically skilled labour was declining. Sir Dinshaw Petit came to the assistance of the combined committees with a munificent gift of land and buildings for the purpose of the school, and, in September last, though the buildings were only partially ready, a beginning in actual instruction was made with a hundred and twenty students. A month later, another hundred and twenty were admitted. The buildings have now been completed, and the demand for admission as students exceeds the capacity of the buildings—over a hundred candidates awaiting vacancies. The textile department has been supplied free with machinery made by Messrs. Platt Bros. of Oldham. The Institute has made such a splendid start, that there is no doubt Bombay will one day become one of the greatest technical educational centres in the world.

For some years past, various attempts have been made to start cotton-spinning mills in China, but nothing came of the projects. Some twelve months ago, the Chinese Government entertained the project, and the order has now been placed for a spinning mill with 12,000 ring spindles, and with motive power to drive 20,000 spindles. The extension of the remaining 8,000 spindles will be put down at a future period. The mill is being supplied complete with the latest and most improved machinery, and the entire order for machinery, motive power, and stores has, after keen competition, been placed with a Manchester firm, Messrs. Soutar, Lehmann and Co., of 46, Bloom Street, Manchester, who are the contractors for the supply of the entire plant, and who are sending out the skilled labour.

1st MAY 1910

LACE OR TAPESTRY CURTAIN.

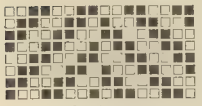
PRINTED BLIND.

PRINTED MUSLIN.

Fashionable Designs.

Mantle Cloth.

No. 580.



Design.

Draft.

Pegging Plan.

Warp :—

28 ends Grey,	25 skeins woollen.
1 end Print,	,,	,,
5 ends Grey,	,,	,,
1 end Print,	,,	,,
3 ends Grey,	,,	,,
1 end Print,	,,	,,
5 ends Grey,	,,	,,
1 end Print,	,,	,,

45 ends in pattern.

Weft :—

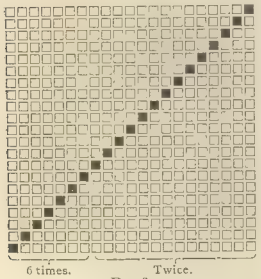
29 picks Grey,	25 skeins woollen.
1 pick Print,	,,	,,
5 picks Grey,	,,	,,
1 pick Print,	,,	,,
3 picks Grey,	,,	,,
1 pick Print,	,,	,,
5 picks Grey,	,,	,,
1 pick Print,	,,	,,

46 picks in pattern.

2,112 ends in warp; 33 ends per inch; 11's reed, 3 ends in a dent; 30 picks per inch; 64 inches wide in the loom; 56 inches wide when finished. Weight 10 ozs.

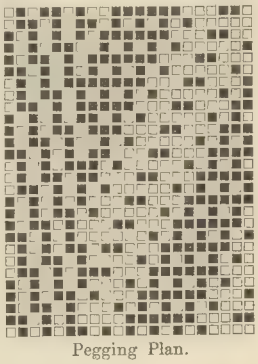
Worsted Trousering.

No. 581.



6 times. Twice.

Draft.



Pegging Plan.

Design is first 7 ends of Pegging Plan six times repeated, and last 14 ends twice repeated as per draft.

Warp :—21 ends Black,	2/36 worsted.
1 end Black and White twist,	,,	,,
20 ends Black,	,,	,,
6 ,, Black and Red twist,	,,	,,
16 ,, Brown,	,,	,,
6 ,, Black and Yellow twist,	,,	,,

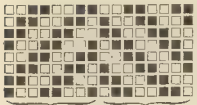
70 ends in pattern.

Blue weft, 2/36 worsted.

6,272 ends in warp; 98 ends per inch; 12½ reed, 8 ends in a dent; 72 picks per inch; 64 inches wide in loom; 56 inches wide when finished. Weight 17 ozs.

Woollen Trousering or Suiting.

No. 582.



3 times. 3 times.

Design.

3 times. 3 times.

Draft.

Pegging Plan.

Warp :—1 end Red and Yellow twist,	15 skeins woollen.
1 ,, Green,	,,	,,
3 ends Brown and White twist,	,,	,,
1 end White,	,,	,, } 4 times.
1 ,, Straw,	,,	,,
4 ends Brown and White twist,	,,	,,
7 ,, Straw,	,,	,,

24 ends in pattern.

Brown weft, 14 skeins woollen.

1,920 ends in warp; 30 ends per inch; 10's reed, 3 ends in a dent; 32 picks per inch; 64 inches wide in loom; 56 inches wide when finished. Weight 17 ozs.

Woollen Suiting.

No. 583.

Design.

Warp :—13 ends Grey,	12 skeins woollen.
3 ,, Brown,	,,	,,
13 ,, Grey,	,,	,,
3 ,, Green,	,,	,,

32 ends in pattern.

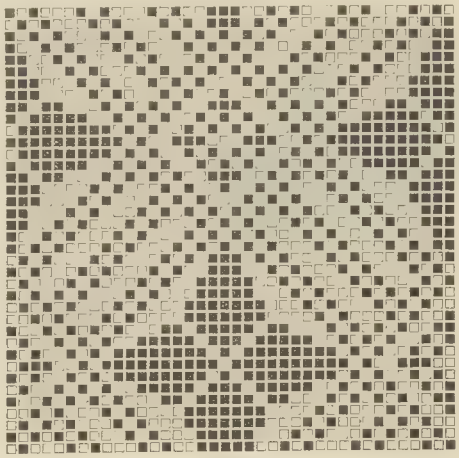
White weft, 12 skeins.

1,920 ends in warp: 30 ends per inch; 10's reed, 3 ends in a dent; 30 picks per inch; 64 inches wide in loom; 56 inches wide when finished. Weight 20½ ozs.

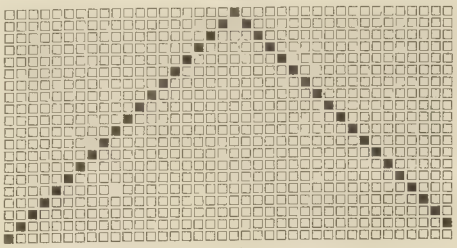
Cotton Dress Goods.

The following design is for Cotton Dress Goods, and should be woven as follows :—Warp and weft, 2/36's, 45's sett; 50 picks per inch. In the Pegging Plan lift White.

No. 584.



Design.



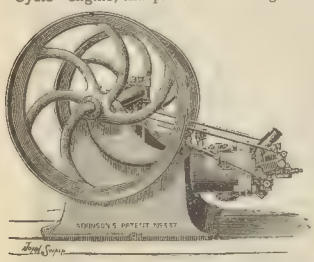
Draft.

For the Pegging Plan take the first twenty shafts of the Design.

MACHINERY, &c.

The Atkinson "Cycle" Gas Engine.

Reference has been made from time to time in our columns to improvements in gas engines. This class of engine is now being much utilised by those engaged in the textile trades, where small powers only are required, and where it is necessary to run portions of machinery overtime, in which case, the saving resulting from using this class of engine, instead of, perhaps, a large steam mechanism, is a considerable item with large firms. The Atkinson "Cycle" Gas Engine, now being produced by Messrs. Manlove, Alliott and Co., engineers, Nottingham, is one of the latest improved types, and one that gained a gold medal in some recent trials made by, and reported upon, by the Society of Arts, the particulars of which will prove of interest to our numerous readers. The engine experimented upon possessed a cylinder 9½ inches in diameter, the radius of the crank being nearly 13 inches. The connecting rod is not jointed to the crank directly as in ordinary engines, but through a toggle link and rocking lever, whereby the piston is made to perform strokes of varying lengths during each revolution of the crank. During each revolution, the piston, starting from the extreme end of the cylinder, makes a long suction stroke, drawing in gas and air; it then retires, making a short compression stroke, which, in this case, was 5·03 inches, compared with the suction stroke of 6·33 inches. Then follows a long expansion stroke, after ignition, which we may term the working stroke, followed by a full length exhaust stroke, which completely clears the cylinder of the products of combustion. The working stroke of the engine experimented upon in the Society of Arts trials was 11·13 inches, and the exhaust stroke 12·43 inches. In engines of the Otto type, the expansion stroke is the same length as the compression stroke, consequently, the exhaust takes place under high pressure, causing an objectionable noise and consequent loss of power. In the "Cycle" engine, the pressure is brought to near zero before exhaustion.



The Atkinson Cycle Gas Engine.

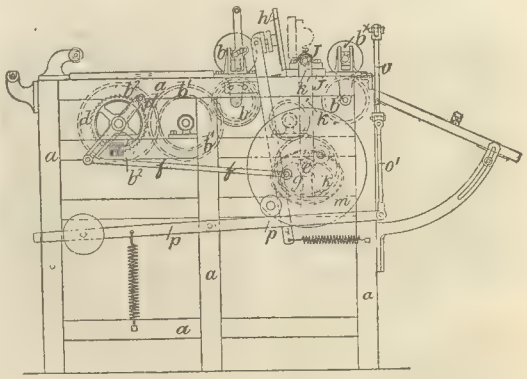
As these strokes are all completed during one revolution of the crank shaft, it follows that there is one explosion for each revolution, as against those engines which only receive an impetus at most every two or three revolutions, so that a greater steadiness of running is obtained than with those of such a type. But there is another, and by no means a small, advantage in the use of the "Cycle" engines over all others, it is this—owing to the completeness with which the cylinder is cleared of the products of combustion at every revolution, the engine may be run for a very long time without requiring cleaning. That this is no small item may be gathered from the fact that many users of gas engines are ready enough to extol their merits, but generally wind up by saying "but they are such a trouble to keep clean." The "Cycle" gas engine has been run for six months without being touched. The accompanying illustration has been taken from a photograph of a 6 H.P. engine, and shows the general construction and arrangement of parts. It is a similar engine to that run at the Society of Arts trials, which yielded the following results:—At 130 revolutions per minute, it developed 9½ B.H.P., and 11·15 I.H.P., so that the mechanical efficiency of the engine reached 85 per cent. The gas consumed was 18.8 cubic feet per indicated horse power, or 22·1 cubic feet per brake horse power, which is, we believe, less than is consumed by any other gas engine. The weight of oil used during a six hours' trial for lubricating purposes was 1·18 lb., costing two shillings per gallon, the bearings being lubricated with grease, and were perfectly cool throughout the trial. According to the report of the experts appointed by the Society of Arts, the heat account of this engine stands as follows:—

Heat turned into work as shown by the indicator diagrams..	22·8
Heat rejected in water-jacket.....	27·0
Heat rejected in exhaust, lost by imperfect combustion, and otherwise unaccounted for	50·2
	100·0

"The actual expenditure of heat was at the rate of 11,250 thermal units per I.H.P. per hour, which corresponds to the absolute efficiency of 22·8 per cent. It is very interesting to notice that the heat expenditure per I.H.P. per hour is little more than half that of the Paxman engine (steam), a difference due, of course, to the greater range of temperature within which the engine works." From this our readers will see that the gas engine must no longer be ignored by users of power, and that the "Cycle" engine possesses so many advantages over most other forms as to undoubtedly lead to its selection in the majority of cases.

Marking and Cutting Machine for Fabrics, &c.

An invention has recently been patented by Mr. T. C. Thompson, Britannia Mills, Lower Mosley Street, Manchester, which has for its object a more convenient and efficient method of marking and cutting samples or lengths of cloths of all descriptions, than has hitherto been usual. In whichever direction one looks in these progressive times, we see old methods, which have their basis in some form of manual labour, superseded by some form of mechanical appliance which not only answers its particular purpose with more ease, but also with greater satisfaction than under the method which it is intended to, and in most cases, does displace. One would almost suppose that we had at last reached that point when all old methods had been relegated to the past. Such, however, does not appear to be the case, as is shown in the apparatus which Mr. Thompson has brought before our notice, which enables fabrics and other goods to be intermittently stamped either in samples or lengths with trade marks, letters, qualities, or other marks. To accomplish this, two pairs of rollers (or in some cases, one pair of rollers is sufficient) are mounted in connection with a table or platform, and between these rollers, the length of cloth, or other goods to be marked, is placed in such a manner that, when the rollers are put in motion, the fabric is drawn forward a given distance. Intermittent motion is given to the rollers by means of a paul or ratchet, either placed upon the axle of the roller, or on a geared connecting wheel for multiplying distance of travel. When the fabric is travelling forward, the stamper is receiving the ink, or other colouring matter, by being pressed against a pad or rollers, and when the rollers come to rest, one cam or more upon the driving or other shaft actuates the stamper, and brings it down upon the table or platform over which the fabric is being drawn, and thus the goods are marked. When desirable, one knife, or more, either of the guillotine or revolving type, is placed in a suitable position, and so actuated, that between every intermittent motion of the rollers, a sample or other length of the fabric being marked is cut off. The accompanying illustration gives a side elevation of the machine, and, from the following description of the mechanism, it will be seen that in actual working a great economy can be effected over the methods now generally in vogue for marking and cutting samples, &c, Upon a frame A, two pairs of revolving rollers B, B, and Bx, Bx, are mounted; these are for the purpose of drawing the fabric for-



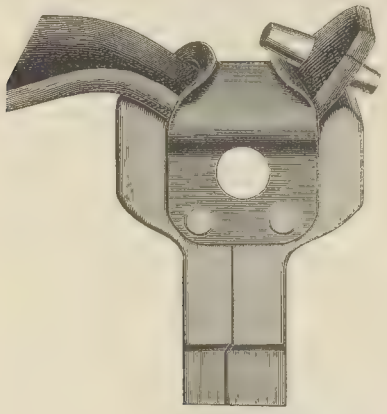
Marking and Cutting Machine for Fabrics.

ward upon a table or platform. Motion is given to the rollers B, B, by means of geared wheels B^1, B^1 and B^2, B^2, the latter being actuated by the paul and ratchet D, D^1, connected by the link F and crank pin G. Ink pads H, and stampers J, are actuated by a cam or cams K on the shaft E. As the stampers rise, they are caused by a pinion and rack to turn partly round, as shown in dotted lines, into a position to be pressed upon by the ink pads H. A knife of a suitable type for cutting off the samples or lengths is connected, by the links O, O^1, to the lever P, P, provided with a counterbalance weight, and is actuated from the shaft E. The apparatus is worthy the attention of manufacturers, merchants, &c., who may require a simple and efficient method of marking and cutting samples of various kinds of fabrics.

Greenwood's Patent Picker.

In the making of what may be termed small, but still necessary, appliances in the textile manufacturing branch, there have been numerous and efficient improvements made during the past few years, and, notwithstanding this, patents are still being applied for which, in many cases, have merits that stamp them as being of great utility to the industries for which they are specially adapted. In the making of pickers for looms of various kinds, the inventions are almost innumerable, some having advantages of one kind, whilst others claim equal advantages of another kind. What with the present state of competition, and the general desire of makers of various appliances to be at the "top of the tree" in the general excellence of their productions, it is no wonder that there is such a keenness exhibited on all sides to have more efficient apparatus, and thus it is that new ideas are being continually worked out and put upon the market, the tendency of which is to economise as much as possible, even in what may be termed

trivial matters. One of the latest patents in connection with a minor branch of apparatus used in the manufacturing of textile fabrics of various kinds is for an improved picker, a glance at the illustration of which will quickly give to those engaged in the trade an idea of the numerous advantages to be gained by its use. In the pickers generally employed, one of the great drawbacks has been the inserting of the picking band through the slots or holes at the top of the picker. Perhaps the time actually taken in working this operation on one picker is not thought of much account, but where the looms are numbered by hundreds, the time occupied collectively for the process amounts to more than is generally calculated upon. Then again, when the picking bands are placed in many makes of pickers, the pull is far from straight, the consequence being that the bands are soon worn, and break at certain points, and in operation, the picking is too often erratic and uneven. In the picker under notice, these disadvantages are entirely obviated by a very simple contrivance. Looking at the illustration, it will be seen that the picker is of the generally recognized pattern, with the exception of the upper portion. Instead of the picking band being inserted as ordinarily, the upper part has a contrivance of Swedish bar iron, of such a quality of metal that it can be made into the required form by means of a specially shaped die. This is slipped down the upper part of the picker and rivetted, when it is ready for use. The picking band is simply inserted through the opening, and the peg is fixed in the usual manner. This operation can be done in a few seconds by a child. In addition to the time saved, the picker secures other advantages guaranteed by the patentee:—In the first place, only half the picking bands generally used are required, as breakages are reduced considerably; in the second, it allows of a straight pull with the full width of the bands; third, from the easy and regular manner in which it does its work, there is no damage done by grease being thrown from the bands on to the cloth; and fourth, it gives an improved pick, owing to the fact that the stroke is below the spindle, and there is no half-twist in the bands, as is the case when they are fastened through a slot in the top of the picker. Mr. John Greenwood, Victoria Works, Calder Street, Todmorden, the patentee, will be glad to enter into correspondence with any firm engaged in manufacturing textile goods, and will give full particulars of the improved picker.



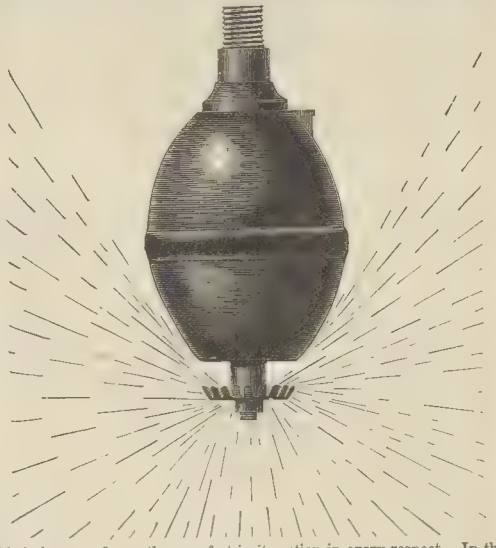
Greenwood's Patent Picker.

Smoke Preventing Mechanical Stokers.

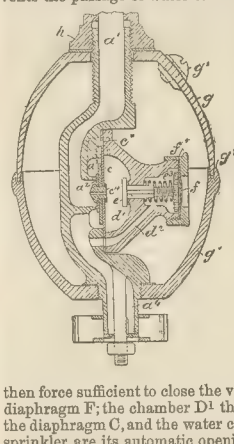
In a speech made recently at "The Hollins," Bolton, before an influential deputation, Mr. Councillor Herbert Fletcher said that he advocated the system of the mills and foundries and other establisments being supplied with Smoke Preventing Apparatus at the expense of a general rate. It is, however, to be hoped that, before it comes to this, manufacturers will, from a sense of duty towards their fellow men, be induced to take the matter up themselves, and, by the adoption of an efficient mechanical stoker, put a stop to the smoke nuisance, which is a disgrace to our civilisation. On the invitation of Mr. Councillor Fletcher, the above-mentioned deputation from the Bolton Corporation, the Rural Sanitary Authority, and the Kersley Local Board, visited a number of establishments where the smoke nuisance has been successfully dealt with, and amongst others Messrs. James Musgrave and Sons' extensive mills at Bolton, where twelve furnaces are fitted with Hodgkinson's Patent Mechanical Stokers. According to the published report, the chimneys were entirely free from smoke. Besides these stokers for their own mills, Messrs. Musgrave have ordered a number of Hodgkinson's stokers for mills in Russia, where they have supplied the boilers. In addition to a great number of machines sold in Great Britain and Ireland, Hodgkinson's stoker is working satisfactorily in France, Belgium, Germany, Holland, Russia, Poland, Sweden, America, India, China, Australia, and the Fiji Islands, which is the best proof of its simplicity and universal applicability. Messrs. Hodgkinson and Co., Limited, Engineers, Ordsall Machine Works, Salford, Manchester, will have pleasure in giving full particulars of their Smoke Preventing Mechanical Stoker to all interested in such apparatus.

Automatic Sprinklers or Fire Extinguishers.

In continuation of the articles on Automatic Sprinklers, we now put before our readers the merits of the "Watchman," which was casually mentioned in an earlier issue of our Journal. This fire extinguisher, like the last one described—the "Draper-Hetherington"—closes automatically after it has been in action upon fire and has extinguished it; it is then once more ready in case a fire breaks out at a future time. The manner in which this is accomplished will be explained later. The mechanism of the "Watchman" is, on the whole, simple and effective, and not liable to get out of order, as is proved by the fact that a sprinkler which we saw working a few days ago had operated upon fires upwards



of 300 times, and was then perfect in its action in every respect. In the production of the apparatus, an outer shell or casting is made of brass, the shape of a lemon. The general mechanism can be seen from the annexed engraving, but this can be altered to suit different requirements. The sprinkler contains, in a chamber G, an expansion liquid or fluid, which liquid, when the temperature reaches a required height, acts on the mechanism of the sprinkler in such a manner that a large volume of water flows in the form of spray or a shower, and falling upon a newly created fire quickly extinguishes it. The water from the supply pipe passes to the diaphragm C, and through the small hole C^4 in it to the chamber D^1, from which the valve E prevents its escape; this brings the full pressure of the water supply upon the chamber D^1 side of the diaphragm C, which, being of larger area than the inlet from the passage A^1, presses the diaphragm C close against its seating A^2, and thus prevents the passage of water to the sprinkler or distributor; but should the temperature of the room in which a sprinkler is fixed increase to the extent arranged upon, the fluid within the vessel G expands and acts upon the expansion diaphragm F, which pushes against a screw nut, and upon the stem of a valve E, against the pressure of a spring E^3, and opens the valve, which allows water to pass from the chamber D^1, through the diaphragm D, and, consequently, the pressure holding the diaphragm valve against its seat is removed, and the diaphragm valve C is forced by the entering water away, and passes the seating into the annular cavity A^3, and along the passage A^4, to the sprinkler, when the water immediately acts upon the fire. When the temperature of a room diminishes again after a fire to the point fixed upon, the expansion fluid contracts or condenses, and the spring E^3 has then force sufficient to close the valve E against the action of the expansion diaphragm F; the chamber D^1 then fills with water, and its pressure closes the diaphragm C, and the water ceases to flow. The leading features of the sprinkler are its automatic opening and closing, combined with a simple provision for so regulating these operations that it will open at any



temperature previously fixed upon, from 80° Farenheit upwards, and afterwards close again when the temperature falls below the arranged degree. The closing automatically is a decided advantage, and one that will be fully considered by users of this class of mechanism, as the damage done by excess of water after a fire has been extinguished very often exceeds that caused by the fire itself. Another advantage claimed is that, when a sprinkler is once fixed, it will maintain its power of action independently of the number of times it has operated. As before stated, we had, recently, an opportunity of seeing a sprinkler in operation, and it did its work in a very satisfactory manner. It was first tested with a distributor that spread the water to a distance of about 20 feet, and after running until the temperature fell to that previously fixed upon, it immediately closed. Other experiments were tried with various kinds of distributors, and all came out of the ordeal satisfactorily. Numerous tests have been made during the past few months with the apparatus, and we are given to understand that, without exception, they have been successful. The makers of the "Watchman"—Messsrs. Crawshaw and Tonge, Henry Street, Rochdale, will be pleased to afford all parties interested in sprinklers every opportunity of testing the efficiency of this apparatus, and will, on application, give full particulars of cost of putting in all necessary fittings complete, or of the sprinklers only.

Wool Dyeing.

A publication by Max Brieul, a German writer, supplementing Knecht's papers on the theory of dyeing, and based somewhat on the same lines, might be said to treat on the "theory of stains," summing up, as it does, the author's unconcluded research on the cause and chemical nature of those irregularities met with so frequently by the cloth dyer and finisher. Such stains, occurring in the use of basic and acid colouring matters, and of certain natural colouring matters, frequently seem to admit of no ready explanation. They appear, where an unskilful treatment of the goods—viz., an insufficient steeping—is out of the question, even so that, on simultaneously working two pieces, the one will come out right, the other faulty. Except in special cases, chemical and microscopical examinations of these stains gave no clue to their origin, so that the author finally resolved to try and bring about similar effects under known conditions. He, consequently, in places, impregnated the cloth with such chemicals as, before the dyeing, are likely to come in contact with the fibre—viz., dilute acids, alkalis, and soap, and after rinsing, drying and steaming, observed its behaviour in the dye-bath. The consequent effect of these chemicals is more evident when the pieces have been dried hot or steamed; light or dark spots then appear, as a rule, even if, before dyeing, the cloth be repeatedly boiled in clear water, till no more acid or alkali can be extracted. Of acid, sulphuric of 6° Tw. (the strength used in carbonising) was experimented with. Unevenness during the dyeing in this case was always observed; with basic colours, the impregnated parts remained lighter; with acid colours, they became darker than the surroundings. A prolonged treatment in the bath, however, always acts levelling, the more so if acid of 1.5-3° Tw. only was used, and no steaming. Even on cloth stained with acid of 6° Tw., and dried hot, the excess of colour first fixed is removed by prolonged boiling, till irregularities will be visible in transparent light only. If the effect of this acid, however, is assisted by hot drying, and finally steaming, even prolonged boiling in the acidulated dye-bath fails to remove the damage. Analogous experiments on adjective dyes, viz.:—such of the alizarine and logwood class, which require a mordant—are not yet concluded. More striking than the effect of dilute acids is that of carbonate of soda and caustic soda solutions of 1 and 1½ per cent. respectively. Cloth thus padded, dried, and steamed, showed a very visible deterioration of the fibre; the affected places not only turning yellow, but considerably losing in strength. After steeping in hot water, they come from a neutral dye-bath marked with white spots, precipitated colour base no doubt acting as a preventative. If the free alkali has been removed by continuous washing previous to dyeing, dark stains result. Against all expectations, alkalised goods are also stained dark with some acid colour, especially acid blue. Adjective dyes, after the necessary mordanting with alumina, iron or copper compounds, leave dark blots; this is most marked in logwood blues. Chromium and tin compounds are not affected. With large soda stains, the edges always appear darker than the centre, and it is here that the fibre has suffered most—a fact due, perhaps, to capillary action. To prove that these dark spots were not a consequence only of the yellow bottom due to alkali, but that a correspondingly large amount of colour and mordant had been fixed, blots of logwood blue were on one hand digested with hydrochloric acid, whilst on the other, the ash obtained by combustion was determined. Double the amount of hœmatein came off these places than was yielded by the surroundings, whilst the ashes stood like 2·35 to 2 per cent. These facts would indicate that, by the action of alkalis on wool, on decomposition of the latter, one or more bodies are formed (most probably acids or their soda salts) having, like tannates, the property of fixing basic colouring matters, metallic oxides, and, consequently, polygenetic pigments. These decomposition products may be insoluble or soluble in water; in the last case, to withstand washing, they must possess a considerable affinity for the fibre. Likewise, the behaviour shown by acid-tainted goods, towards acid colours, makes it likely that bodies have been produced, capable of giving insoluble lakes with coloured sulpho-acids. Of decomposition products of wool, several are well known, particularly leucine, asparaginic acid, tyrosine and others, and their behaviour towards pigments and mordants was subjected to close investigations. Leucine solutions only incompletely precipitate basic colouring matters, whilst, with leucinic salts, they soon changed into insoluble compounds. Acid colours are not precipitated by leucine or leucinic solutions. Cold saturated solutions of asparaginic acid, or of its salts, have no effect on either basic or acid colouring matters or mordants. The dark stains caused on alkali-tainted cloth by basic colours could thus be easily understood under the supposition that the soda salt of leucinic acid be in a sufficient degree retained by the fibre. To widen the field of his observations, the author further experimented, as Knecht did, on the solutions obtained by boiling both with acids and alkalies, and by subjecting it to the action of over-heated steam. Wool decomposes, though slowly, on boiling with water at ordinary pressure, yielding volatile bases, sulphuretted hydrogen, and other substances. If heated with water for some hours in a sealed tube at 150° it entirely dissolves. The resulting bad-smelling, yellowish liquid reacts strongly alkaline, and on acidulating yields flakes of a sticky precipitate. This liquid throws down the salts of earth and the mordants with the exception of bichromates, and with basic colouring matters and benzidine colours, it yields insoluble lakes. Acid colour solutions, such as acid magenta, scarlet, and others, are only rendered tinted, falling after acidulations. On filtering off the sticky precipitate, caused by the addition of acid to original solution, a clear liquid results, which, with all acid colours (azo-colours and sulpho-acids of the rosaniline group), yields coloured lakes. Bichromate also gives a precipitate, whilst other mordants only fall after neutralising carefully. The precipitate mentioned, after washing with water, behaves towards basic and acid colouring matters like wool, showing, perhaps, a still greater affinity for the dye. To determine in the same way the properties of analogous reaction products between wool and acid, the fibre was boiled in dilute hydrochloric acid (1·1) till all was dissolved. The filtered yellow liquid (like that obtained by Knecht) on treatment with dilute sulphuric acid gives, with acid colours, intensely coloured precipitates, and also a yellow product with bichromate. Acid magenta and acid green remain unaffected; likewise basic dyes and mordants. On carefully neutralising the acid solution with alkali, a voluminous precipitate ensues, having the same properties as those yielded by acidulating of the above described aqueous solutions. The filtrate itself, like tannic acic, precipitates all basic dyes, and also most of the acid colours. Sulpho-acids of the rosaniline series, however, are scarcely fixed—a remarkable feature when we consider it is these which are the most difficult to exhaust in the dyeing. On boiling wool in a solution of caustic soda, and neutralising with hydrochloric acid, a flocculent precipitate again falls, acting against colouring matters, as do the insoluble products obtained before. The neutral or slightly acid filtrate throws down all basic colours, iron, alumina, and other mordants, whilst acid colours only fall on acidulation. The summary of these experiments is that on decomposing wool with water, alkalis and acids, soluble and insoluble compounds are formed, having the property to precipitate from their solutions a great many dyes and mordants. To their presence, doubtless, is due, in many cases, the uneven shading of goods in the dyeing process. A chemical reaction between these compounds and dyes and mordants, if not in all cases, is in many instances clearly established, and adhering to the homogeneous character of the wool fibre, the author comes to the conclusion that if the radicals of these bodies are not essential in the wool molecule, they are formed during the dyeing process, as Knecht has already suggested to be the case when fixing acid colours in an acid bath.—*Journal of Society of Dyers and Colourists.*

The "Manchester" Limited.

This well-known Restaurant, which is in the form of a shed, and is under the Manchester Royal Exchange, has recently been taken over by a Limited Company, and is now under an entirely new management; the Directors have, in fact, quite revolutionised the place, possibly the most important improvement being in the lighting. A description of an electric installation in a restaurant would be quite out of place in the pages of a Textile Journal, but as the lighting of the building is specially suitable for factories and sheds, we have pleasure in giving a short description of it A contract was entered into with the Manchester Edison Swan Company, Limited, for the fitting up of the entire electrical plant necessary for the purpose. A 16-H.P. nominal horizontal twin engine, already on the premises, has been overhauled and utilized for the driving of a specially constructed dynamo, capable of working 300-16 candle power incandescent lamps. This dynamo is arranged to work at a moderately slow speed, on account of its being in use under full load all day long, and it is compound wound, so that lamps may be turned on or off without affecting the illuminating power of the remainder, and without varying the speed of the engine; at the same time, although the speed remains constant, the power expended is proportionate to the actual number of lamps in use. The dynamo is placed in a sub-basement, where ventilation is difficult, still there are no signs of under heating, and it works absolutely without sparking at the brushes. The current developed by this machine is carried along two main curcuits, which consist of copper cables most efficiently insulated with India rubber and prepared cotton. On one of these circuits are arranged all the kitchen lights and those in the wine

cellars; the other, which is the larger, supplies all the ground floor lamps, of which the majority are in the large dining-room. All the cables and wires are incased in moulded wood-work throughout, and are, therefore, not only out of sight, but thoroughly protected from harm. The original gas fittings have been made use of as far as was practicable, and, in other cases, special fittings have been supplied. Ornamental globes and shades of various patterns carefully selected to suit the decoration of the rooms have been used, and a most efficient system of safety fuses has been adopted. In addition to the main switches in the engine-room, special switches are provided in the various rooms and in the billiard-room; these are arranged one to each table, the switch being fixed near the ceiling and controlled by an ornamental chain, which enables the lights to be turned on or off with the greatest ease. Over each of the tables, there are 6-25 candle power lamps—the light from which is brilliant, steady, cool, and most admirably adapted for such a purpose. The benefit of electric lighting in a room of this character is very marked indeed. From our own experience, we are satisfied that to play upon tables electrically lighted is not only very much pleasanter, but has none of those unhealthy influences which are common in rooms lighted with gas. The entire work, which was carried out within the few days of the Easter holidays, reflects much credit upon the staff and resources of the Manchester Edison-Swan Company, Limited.

The Cotton Trade of Canada.

(Continued from page 40).

THE mills that engage in the yarn trade for the home Canadian market are few in number, and are located either in Nova Scotia or in New Brunswick, at the extreme east of the Dominion, or in Ontario, at the extreme west end of Industrial Canada. The yarn trade is still capable of considerable expansion if the manufacture were undertaken by men who knew their business, and had a plant suitable for the specialties required. Yarn, chiefly dyed, is still being imported from England and the States, and many small manufacturing industries, which are now crushed out of existence by the impossibility of obtaining the yarn they require at a reasonable price, would soon flourish, could they purchase in Canada that required by them. At the moment, this trade consists of single 5's to 10's warp yarn in the bundle—these counts are sold in 5lb. bundles, both grey and bleached as well as dyed; of two-fold 16's warp yarn in 10lb. bundles, also grey, bleached and dyed. The bundles are put up without damping, and are full weight without the paper. They are used by the hand-loom weavers, who purchase the yarn from the country store-keepers. They are, therefore, papered with good paper. Were the hanks damped, the high temperature at which the stores are usually kept during the winter would soon result in detection by loss of weight. Carpet warps are made in two-fold as well as in four-fold. These warps are also made grey and in colours. The consumption of carpet warps is chiefly in the Provinces of Quebec and of Ontario. Sail twine, four and six-ply and store twine, made chiefly from waste, are more or less produced, as are also single and two-ply warps for woollen mills, as well as cotton yarns for the hosiery mills, of which a considerable number exists in Canada. These hosiery yarns are chiefly made from cotton dyed before being spun. Most of the hosiery mills are small and have not yet attained to knitting their cotton hose from grey yarns and dyeing them after being knit. These mills being spread all over the Dominion makes it impossible to send their grey productions to a dye-house to be dyed for them—the freight charges amounting to a figure so considerable as to preclude this being done. The hosiery yarn as now made in Canada is probably the least successful of any of the products of Canadian mills at the moment. The single 5's to 10's yarn, and the two-ply 16's yarn are of superior quality, the better makes being level, clean, and very strong. The colours chiefly in request are indigo, blue, brown, orange, green, and red, and, in all cases, the colours are required to be as fast as possible. Candle wicks—chiefly used for lamps in the mines—and paraffin lamp wicks are also made, but only in limited quantities, as there is not a large consumption. There are two or three batting mills, but the best qualities are still imported from the States. The remarks made in the previous article about producing American sheetings in Canada for the China market are equally applicable to the production of 30's water twist for the same market. A mill properly erected, located, and managed, would be able to run some of the present English mills a very close race. The lower cost of cotton and the reduction in freight and packing charges making a set off against the enhanced cost of machinery, especially as the mills work there 60 hours per week as against 56½ hours in England.

Parcels not exceeding 7 lbs. in weight may be received at any post office in the United Kingdom for transmission to Mauritius; they will be despatched from London, *via* Marseilles, in closed mails, twice every month. The charge for a parcel not exceeding 3 lbs., is 3s. 2d.; exceeding 3 lbs., but not exceeding 7 lbs., 8s. 9d. The postage must, in all cases, *be paid in advance*, and by means of postage stamps, which must be affixed by the sender, and no parcel will be accepted for transmission which is not sufficiently prepaid.

The Paris Exhibition.

The Paris Exhibition was opened on the 6th May, with the usual fetés which accompany such shows. The English section is well worth a visit, although the textile industries might, perhaps, have been more fully represented. Amongst those whose names we notice, are Messrs. Armitage Bros., Huddersfield; Edward Brooke and Sons, Huddersfield; John Carter and Co. Halifax. John Crossley and Sons, Halifax; John Dewhirst and Sons, Skipton; Hargreave and Nusseys, Leeds; Lister and Co., Manningham, Bradford: Sir Titus Salt, Bart., Sons, and Co., Saltaire, Bradford; T. W. Tetley, Bradford; J. Thorp and Sons, Huddersfield; Robinson and Cleaver, Belfast; York Street Flax Spinning Co., Belfast; Johnson, Sou, Allsop and Co., Bolton; Lee Spinning Company, Manchester; Barlow and Jones, Bolton, and John Bright and Bros., Rochdale; Amongst Machinery, &c, makers are Messrs. Greenwood and Batley, Leeds; Thomas Broadbent and Sons, Huddersfield; George Hodgson, Bradford; Leeds Forge Co., Leeds; J. Hattersley and Sons, Leeds; Samuel Chatwood, Patent Safe and Lock Co., Manchester; Hulse and Co, Manchester; David Mosley and Sons, Manchester; Reddaway and Co., Manchester; George Thomas and Co., Manchester; Thwaites Bros., Bradford; Wilson Bros., Todmorden; and Crossley Bros., Manchester. Galloway's Limited, Manchester, have provided a set of illuminated fountains similar to those which they had at the Manchester Exhibition in 1887. These cannot fail to provide pleasure to the visitors to the Paris Exhibition. Next month we shall have fuller particulars of those exhibits which are most interesting to our readers.

Pure Oxygen Gas.

Pure oxygen gas, says A. H. in the "English Mechanic," may be obtained from the atmosphere at a trifling cost, so as to enable it to be collected in unlimited quantities in gasometers, like coal gas, for application in the arts, manufactures, etc. This process depends upon a peculiar property possessed by the earth baryta of absorbing oxygen at one temperature and evolving it at another. The process is as follows:—Mix the baryta with a portion of hydrate of calcium or of magnesium; place the mixture in an earthen tube heated to dull redness; oxidize it by passing a current of atmospheric air over it. As soon as the oxidation is complete, connect the tube with the gas holder, and allow a jet of steam to act upon it. This converts peroxide of barium into hydrate of barium, and the excess of oxygen is given off and collected in the gas holder. The baryta is then again oxidized by a fresh current of air, and deoxidized by steam. The whole process may be repeated as frequently as required. One ton of baryta thus treated yields about 2,500 cubic feet of pure oxygen every twenty-four hours, and this, as it does not lose any of its properties, at the mere cost of fuel and labour.

According to *Kemp's Mercantile Gazette*, the number of failures in England and Wales, gazetted during the four weeks ending Saturday, April 27th, was 303. The number in the corresponding four weeks of last year was 343, showing a decrease of 40, being a net decrease in 1889, to date, of 31. In addition to these gazetted failures, there were 309 Deeds of Arrangement filed at the Bills of Sale Office during the same four weeks. The number filed in the corresponding four weeks of last year was 272, showing an increase of 37, being a net increase in 1889, to date, of 193. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, April 27th, was 866. The number in the corresponding four weeks of last year was 942, showing a decrease of 76, being a net decrease in 1889, to date, of 728. The number published in Ireland for the same four weeks was 43. The number in the corresponding four weeks of last year was 41, showing an increase of 2, being a net decrease in 1889, to date, of 36.

According to a new French process, the residue from wool scouring is utilized in an efficient and profitable manner. The waste liquor is first passed through a coarse cloth stretched on a wooden frame formed like a baker's trough, by which all the wool and coarse matter in suspension are removed, the waste then being allowed to overflow into a gutter of masonry which is partially barred at intervals by bricks to arrest the solid matter in the form of mud, this being a very valuable manure. The water is received into a large cistern, where it rests for several hours, and deposits the rest of the matter in solution; it is then drawn off by a pump into a wooden vat, and mixed with sufficient hydrochloric acid to saturate the free alkalies, and that which forms part of the soap, decomposition taking place, and deposition in three layers. The middle layers, which has a milky appearance, contains various animal matters, while the upper and lower layers contain fatty acids, and also a matter the same as that of the middle layer. The middle layer is conveyed into a cylindrical vessel charged with large pieces of limestone, which disengage the hydrochloric acid from its first combination, forming chloride of lime, which remains in solution. From this vessel the water runs into another containing milk of lime, with which it is mixed until there is a decided disengagement of ammonia, the solid matters now falling to the bottom. The two other layers, now mingled by the withdrawal of the middle one, are thrown upon another filter of the same kind that retain the fatty acids. It has been definitely ascertained that the wool yolk forms at least one-third of the weight of raw merino wool, and that the wool yolk is a peculiar potash compound, which the sheep draw from the land on which they graze, and which is eventually excreted from the skin along with the sweat.

PATENTS.

Applications for Letters Patent.

Beaming yarns and mechanism. J. E. Dow, Glasgow.	25th Mar.	5,110
Belt pulleys. W. Begg, Glasgow.	29th Mar.	5,387
Bobbin frames for looms for carpets, &c. A. and G. A. Whittal, London.	6th April	5,923
Bars of flats, card foundations and means of fastening card clothing to carding engine flats. J. Bullough, Halifax.	13th April	6,335
Cop-winding frames. J. E. Dow, Glasgow.	25th Mar.	5,109
Carrying or packing plush, &c., and apparatus. A. Shaw, Halifax.	28th Mar.	5,307
Cutting weft pile fabrics. W. Gadd and O. Drey, Manchester.	30th Mar.	5,455
Curtains, &c., on curtain machines. E. Doughty, Nottingham.	2nd April	5,603
Cut-pile fabrics and apparatus. G. A. J. Schott, Manchester.	2nd April	5,604
Cutting cloth, &c. A. J. Boult, London.	2nd April	5,642
Combing wool, &c. G. Smith, Bradford.	4th April	5,741
Counting device for weaving. M. Kohl, London.	5th April	5,801
Cutting, shearing, cropping pile, &c., fabrics. J. Farran and F. C. Crawford, Manchester.	5th April	5,814
Curtains. J. Paton, Glasgow.	5th April	5,854
Connecting picker to picker arm. R. Craven, Manchester.	6th April	5,903
Cutting pile of fabrics. J. Platt, Manchester.	6th April	5,885
Carding engines for cotton, &c. J. Walmsley, Huddersfield.	6th April	5,931
Calendering. T. and J. H. Pickles, Manchester.	20th April	6,718
Conditioning, damping, moistening yarn, &c. W. Hurst, Manchester.	20th April	6,723
Damping warps in loom. J. W. Dean, London.	26th Mar.	5,186
Doubling and twisting yarns and threads. G. H. Holden and J. Ashworth Manchester.	2nd April	5,687
Dyeing, scouring, cleansing hanks of textile materials. D. F. Harrop, London.	4th April	5,793
Disintegrating and cleaning fibre. J. Dowling, London.	5th April	5,821
Drawing and roving frames. T. Watson, London.	5th April	5,865
Damping warps whilst weaving. G. Huck, Burnley.	8th April	5,954
Drop-box motion of looms. W. H. Crompton and W. Horrocks, Manchester.	9th April	6,040
"Dust trunks" or "chambers" through which the cotton or other fibrous material passes in its transit from the "breaking-up," &c., machines to "exhaust-openers," &c. T. R. Marsden, Manchester.	13th April	6,306
Damping or dewing textile fabrics, yarn, &c. W. Brierley and R. Hopwood, Manchester.	17th April	6,554
Drop-box motions. W. H. Hackery, Manchester.	20th April	6,715
Expanding leasing combs of warping or beaming machines. J. H. Whitley, Halifax.	10th April	6,127
Forming and packing warps and portions. J. H. Stott, Manchester.	2nd April	5,607
Figured fabrics. T. Taylor and J. Warburton, Manchester.	4th April	5,776
Frames for jute, &c., fabrics. R. J. Newton, London.	6th April	5,926
Finishing or "beetling" woven fabrics and apparatus. G. O. Hunstone, Manchester.	11th April	6,200
Glove, &c., fabrics in traverse warp machines. J. Upsdale, London.	18th April	6,691
Head and shuttle-box operating mechanisms and construction of shuttle-boxes. R. L. Hattersley and J. Hill, Keighley.	2nd April	5,599
Healds. R. Briggs-Bury, Manchester.	15th April	6,456
Jacquards for operating warps in looms, lace-making, or other machines. T. Gill, Keighley.	12th April	6,239
Jacquard looms for tapestry, worsted coatings, &c. G. Milligan, Halifax.	20th April	6,706
Looms for chenille, &c. S. Pitt, London.	26th Mar.	5,206
Lags and pegs. K. Jowett, Keighley.	30th Mar.	5,499
Looms for "terries" or "pile" fabrics. J. Farran and F. C. Crawford, Manchester.	5th April	5,813
Loose reed looms (locking mechanism). W. Turner, London.	8th April	5,950
Mules for spinning. W. Hurst, London.	30th Mar.	5,458
Mountings and fasteners for securing card-clothing to the bars of flats of flat carding engines. E. Tweedale, Halifax.	1st April	5,540
"Naps." J. F. Rouse, Bradford.	8th April	5,987
Opening, separating, cleaning fibres. W. S. Archer, London.	3rd April	5,734
Picking sticks for looms. R. Dean and M. Johnson, London.	30th Mar.	5,456
Pressing woven fabrics. G. H. Mann, Leeds.	4th April	5,747
Pickers (loom). T. Radcliffe, London.	12th April	6,243
Pickers (loom). S. Metzler, London.	12th April	6,361
Picking arms for looms. E. Crowther, Huddersfield.	18th April	6,630
Preventing shuttles slipping out of their way. C. O. Kramer, London.	18th April	6,651
Rollers in machines for soaping, dunging, dyeing, &c. E. Bentz and A. Aird, Salford.	5th April	5,810
Reeling machines. W. Dean, Manchester.	12th April	6,238
Reeds for looms and warp frames. H. S. Ball, London.	12th April	6,357
Ribbon loom. P. von Stein, Birmingham.	12th April	6,365
Spindles and flyers. J. Leyland, London.	26th Mar.	5,147
Securing card fillets or clothing to cylinders. G. H. Schofield, Manchester.	27th Mar.	5,259
Shedding mechanism of looms. M. and W. Mac Ilworth, and A. L. K. Gilchrist, Glasgow.	29th Mar.	5,420
Stretching, straightening, and conducting fabrics and selvages. J. Ashworth, London.	30th Mar.	5,452
Shuttle guards. B. C. Sykes and G. Blamires, Halifax.	1st April	5,541
Sisal hemp (treatment of). A. W. Montgomery, Liverpool.	2nd April	5,582
Scouring, cleansing, and bleaching. E. Bentz, C. and A. Edmeston and E. Grether, London.	2nd April.	5,590
Stretching, dressing, finishing lace, &c. L. Lindley, London.	2nd April	5,702
Shuttle checking appliances. J. W. Howard, Halifax.	5th April	5,830
Self-stoking furnace fire grates. L. Hopcraft, London.	6th April	5,879
Sectional warping machines. E. and W. A. Rothwell, Manchester.	18th April	6,639
Slubbing, intermediate and roving frames. R. Belshaw, London.	9th April	6,046
Spinning, doubling, and winding. C. Owens and T. Houghton, Manchester.	13th April	6,304
Scutchers or lap machines. W. Hurst, Manchester.	13th April	6,327
Shuttles for looms and mechanism for actuating. W. P. Thompson, Liverpool.	16th April	6,519
Shot jack motions for small-ware looms. J. Smithies, Middleton.	18th April	6,626
Separators for steam boilers. J. S. and S. H. Stubbs, Manchester.	20th April	6,719
Transferring patterns to jacquard cards. T. J. and T. S. Birkin and R. Weiss, London.	28th Mar.	5,362
Treating and finishing fabrics. R. Ashworth, Heywood.	30th Mar.	5,453
Tentering and drying machines. J. and W. Horton, London.	30th Mar.	5,459
Turkey carpets, &c. (weaving). Reinhart Baron von Seydlitz, London.	1st April	5,560
Twist lace fabrics. W. H. Willatt, London.	2nd April	5,591
Tentering and hot air drying machines. J. and J. S. Butterworth, London.	5th April	5,824
Tension regulators for spinning machine spindle driving bands. P. L. Kenney, London.	9th April	6,109
Tongues or pegs of shuttles. J. E. Heppenstall, Huddersfield.	13th April	6,383
Throstles, ring frames, &c. E. W. Wrigley, R. Patterson and H. Taylor, London.	16th April	6,486
Travelling flat carding engines. F. Wilkinson, Manchester.	20th April	6,701
Transmitting woven piece goods from one operation to another during finishing, bleaching and dyeing. R. Moulding, Manchester.	20th April	6,717
Woven fringed borders for furniture. E. Kornick, London.	3rd April	5,722
Whirl for spinning spindles. T. and F. A. Hall, London.	6th April	5,934
Weaving towels and other figured fabrics. A. Sowden, Halifax.	8th April	5,960

Patents Sealed.

2,523	3,198	3,427	3,573	4,217	4,250	4,361	4,505
4,572	10,150	10,828	17,699	18,075	18,457	18,489	1,464
1,864	2,266	2,699	3,142	3,490	4,625	4,651	4,794
4,862	4,894	11,384	16,081	18,084	18,625	18,776	18,889
18,920	1,415	2,124	2,349	2,986	3,232	4,066	4,266
4,378	4,476	4,786	4,931	4,938	4,963	5,050	5,052
5,228	5,910	6,060	13,851	14,469	14,823	14,942	15,081
17,653	43	14,975	3,585	3,843	4,468	5,135	5,163
5,287	5,395	5,563	5,614	6,403	7,007	11,412	12,682
19,051	493.						

Printed for the Publishers by JOHN DALE & CO., 17, *Bridge Street, Bradford, and Published by* HORATIO LORD *and* RICHARD THOMAS LORD, *at* 10, *Ann Place, Little Horton Lane, Bradford.*

The Journal of Fabrics AND Textile Industries.

Vol. 15. No. 94. JUNE 12th, 1889. Price 10d.

Contents.

Notices.

The Yearly Subscription—payable in advance—including home postage, is 10s. Cheques and Post Office-Orders to be made payable to H. & R. T. LORD, 10, Ann Place, Little Horton Lane, Bradford, Yorkshire.

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The Publishers are open to receive, from Designers, Original Designs of Carpets, Damasks, Tapestries, Linen, Cretonnes, &c., and such as are accepted will be published with the Designer's name affixed. All Designs sent for approval must be 10 inches long by 7 inches wide for single page, and for double page, 16 inches by 10 inches, and must be accompanied by Postage Stamps sufficient to pay return Postage in case they are rejected.

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Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.

The Paris Exhibition.

The Exhibition in Paris does not appear to have appealed to British manufacturers and machinists with as marked success as our French neighbours might have expected. This is not to be wondered at, the show having, as is well known, a political significance. In the exhibition of 1878, above one-third more space was allotted to Great Britain than has been set apart for her use at the present one. 232,845 square feet is the area occupied by the exhibitors from this country, India, and the Colonies, including Victoria, and the Cape of Good Hope. We may, however, say that, so far as the textile trades are concerned, there is not a fine show, in fact, there is only one well-known loom maker represented, and the great Yorkshire and Lancashire makers of spinning, weaving, &c., machinery are not exhibiting at all. This removes an objection made some time ago, when the people of Leeds were endeavouring to promote an affair of the kind on a large scale in their town. It was thought that Paris would spoil it. However, the great firms are not there, and, therefore, we commend this fact to the notice of those who opposed the Leeds' scheme. The show made by manufacturers of textile fabrics surpasses that of machinists, so far, of course, as numbers go; but even this branch is not what we might have expected, there being only one well-known English firm of carpet manufacturers representing this branch of trade, Messrs. John Crossley and Sons, Limited, Dean Clough Mills, Halifax; their exhibit consisting of carpets of various kinds—jacquard and printed, seamless carpet squares, rugs, and furniture coverings. There is another exhibit of carpets, &c., but this comes from India; it is that of E. Bigex, Srinagar, Cashmere. This shows the process of the manufacture of carpets by native workmen, and also a collection of carpets, shawls, embroidery, &c. Two other Indian firms show similar collections, these being Framjee Pestonjee Bhumgara, and Ardeshir and Byramjee, the former from Madras and Bombay, and the latter from Fort Bombay. Messrs. Barlow and Jones, Limited, Bolton, have a similar case to that shown at Melbourne. This displays some of the best specimens of bedquilts, toilet covers, damasks, swansdowns, dress goods, vestings, &c. Another Bolton firm, Messrs. Jabez Johnson, Son, Allsop and Co., have a like collection on view. Messrs. Rylands and Sons, Limited, Manchester, show a large assortment of the goods they manufacture; as do, also, Messrs. Swainson, Birley and Co., of Preston. The Lee Spinning Company, Limited, Atherton, Lancashire, and Messrs. John Dewhurst and Sons, Limited, Skipton, show cottons of various descriptions. Next we may mention the case of Robinson and Cleaver, Belfast, which contains damask, table, and household linens, plain and embroidered cambric handkerchiefs, linen made into various articles for ladies and gentlemen, and also Irish lace, poplins, hosiery, down quilts and tweeds. The York Street Flax Spinning Company, Limited of Belfast, follow with linen yarns, linen shirtings and dress goods, damasks, towels, drills, plain and fancy handkerchiefs, and other goods suitable for West Indian, South American, and other markets. The Island Spinning Company, Limited, Lisburn, Ireland, and Wm. Renshaw and Co., Limited, Manchester, both show yarns, the former of flax, and the latter, both of flax and ramie, in finished yarns and in the various stages of manufacture. The woollen and worsted manufacturers are represented by a few firms from the Yorkshire and West of England districts, amongst whom may be numbered Messrs. Apperley, Curtis and Co., Stroud; Hunt and Winterbotham, Limited, Stroud; Armitage Bros., Milnsbridge, Huddersfield; J. Carter and Co., Halifax; Thorp and Sons, New Mill, near Huddersfield; Tyler and Co., Llandyssil, South Wales. In these exhibits there is a great variety, including coatings, suitings, trouserings, overcoatings, military and naval cloths, hunting cloths, flannels, tweeds and serges. Messrs. Garvie and Deas, Perth, and Neilson, Shaw, and McGregor, Glasgow, show woollen shawls, rugs, mauds and tartans, &c.; Messrs. John Foster and Son, Black Dyke Mills, Queensbury, Bradford, have a collection of wool goods, mohair and alpaca dress materials, silk seals, mohair and alpaca yarns, whilst a very similar display is that made by Sir Titus Salt, Bart, Sons and Co., Saltaire; Messrs. John Bright Bros., Fieldhouse Mill, Rochdale, have a first-class show of silk plushes and imitation seal and beaver skin, and Messrs. Hargreaves and Nusseys, Leeds, show seal and manufactured skins. The silk industries are represented by Messrs. Lister and Co., Limited, Manningham Mills, Bradford, who have a case of embroidery, knitting, and sewing silks, &c., and by J. C. Nicholson, Hope Mills, Macclesfield, who shows silk and silk fabrics, plain and figured silk for men's and ladies' wear, embroidered silks, silk damasks and brocaded and plain silks for upholstering purposes. There are other cases of silks, but these are exhibited by the best known London dealers—such as Debenham and Freebody, and Lewis and Allenby. In crapes, Norwich produces two exhibitors, namely, Hindle and Sons, and the Norwich Crape Company, Limited, whilst Grout and Co., Foster Lane, London, and Le Gros, Thompson and Co., Gutter Lane, are similarly represented. The Nottingham trade has a few exhibitors. W. Lockwood shows novelties in fancy nets, flounces, laces, &c., in silk, cotton and other materials, and Hill and Co., frillings made from cotton and silk fabrics for personal ornamentation and for trimming articles of wearing apparel. Whitt and Bates exhibit machine made lace, imitation valenciennes, and fine cotton lace, &c.; Messrs. J. and J. Cash, Coventry, show ribbons and woven insertions, initial letters, frilling, woven labels, and towels, &c. There are some exhibitors of underclothing and hosiery, amongst whom are R. Pringle and Sons, Hawick; Ellen E. Eeles and Co., Old Bond Street, London; Cellular Clothing Company, Limited, Aldermanbury, London; Donegal Industrial Fund, Wigmore Street, London, and Slater Bros. and Co., Wood Street, London, who also show silk scarfs, squares, and cravats for gentlemen. We have already mentioned the Indian exhibits of fabrics, &c., and we now notice those of our colonies. The Government of the Cape of Good Hope have sent a selection of mohair and wool, and Mr. Frank Holland Haddon, Adelaide, Cape Colony, has an exhibit of mohair also. Victoria, in its wool industries, is well represented, no fewer than nine firms having sent specimens of wool; these are Bailey and Wynne, Beggs Bros., William Lewis, N. G. Elder, Hon. Phillip Russell, Hon. Robert Simpson, W. H. Davidson, Sir Samuel Wilson, and the Union Mortgage and Agency Company. This completes the list of the principal exhibitors in the textile trades. In the machinery section, the first to claim attention is the exhibit of Messrs. Davey, Paxman and Co., Colchester, who supply the motive power for the British section. Their exhibit consists of a 500 H.P. compound engine, a 200 H.P. compound engine, a 140 H.P. horizontal high pressure engine, a 8 H.P. compound portable engine, a 8 H.P. portable engine, a 6 H.P. horizontal fixed engine, a 4 H.P. horizontal fixed engine, a 4 H.P. independent vertical engine, specimens of boiler work, and an Essex patent vertical boiler. There are other portions of the exhibit which do not interest our readers. For machinery of this class the display is quite an exceptional one. Messrs. Thomas Broadbent and Sons, Central Ironworks, Huddersfield, are always to the front when an opportunity offers itself for displaying their hydro-extractors, a class of machine for which this firm have a wide-spread reputation. On this occasion they are represented by a suspended steam driven hydro-extractor. The diameter of the basket is 60 inches; it is of galvanized steel, wired with tinned copper wire, is suspended upon links to dispense with massive foundations, and is driven by a direct-acting high speed engine.

The machine is suitable for drying wool, cotton, silk, &c., it makes 800 revolutions per minute, and will treat 500 pounds of wool per hour. In some of our former numbers, we have given detailed descriptions of the hydro-extractors made by this firm, who were exhibitors at the Manchester and Glasgow Exhibitions and also at that of Melbourne. Messrs. Galloways, Limited, show a Galloway Boiler 30ft. long, 8ft. diameter, to drive 500 indicated horse power at 100 lbs. working pressure. This class of boiler is so well known that over 7,600 of them are now at work, and such is the capacity of the firm that one can be supplied at almost immediate notice, they having always fifty of them ready for delivery or in course if construction. The firm also display a trophy of Galloway tubes. Besides these there is the illuminated fountains similar to those at other recent exhibitions, such as Manchester and Glasgow, a detailed description of which has already appeared in our pages. Messrs. Crossley Brothers, Limited, Manchester, have a numerous collection of "Otto" Gas Engines ranging from a 14 H.P. nominal horizontal, indicating about 33 H.P., down to a 2 man power or domestic engine, indicating about ¾ H.P. nominal. The Babcock and Wilcox Co., of New York and Glasgow, have a 57 H.P. Babcock and Wilcox patent water tube steam boiler, with a longitudinal drum, 4in. tubes, the space occupied being 16ft. long and 6ft. 2in. wide. This class may be made entirely of wrought metal, and suitable for the highest working pressure. There is also a 89 H.P. Babcock and Wilcox patent water tube boiler, 3in. tubes, cross drum, the space occupied being 12ft. 6in. long and 7ft wide. This boiler is adapted for use in confined spaces. The Worthington Pumping Engine Company, of London and Manchester, are represented by a collection of photographs of their pumping engines which have a well known reputation. The Leeds Forge Co., Limited, Leeds, show Fox's patent corrugated steel furnaces for all classes of boilers, besides other mechanisms for which Mr Fox has become famous. The exhibit which, however, appeals specially to our readers is that of Mr. George Hodgson of Bradford, to which we briefly referred earlier in this notice. The looms on view attract great attention and Mr. Hodgson may be complimented on standing alone as an exhibitor of looms from this country. Mr. Arthur Paget, Loughborough, follows Mr. Hodgson in having a distinctly textile exhibit in his patent self-acting manufacturing, knitting and fashioning machine, and adjuncts for making high class hosiery, and also in his machine for making warp-woven piece goods and shaped hosiery goods made of warp fabric. There are two well known makers of safes, namely—Samuel Chatwood, Limited, Bolton, and Chubb and Sons, Lock and Safe Co., Limited, London. There are also some belting manufacturers amongst whom are Messrs. Reddaway and Co., Pendleton, Manchester; David Moseley and Co., Ardwick, Manchester; Lancashire Patent Belting and Hose Co., Strangeways, Manchester; Gandy Belt Manufacturing Co., Limited, Liverpool; W. Wilson Cobbett, Southwark Street, London; George Angus and Co., Limited, Newcastle-on-Tyne; and George Dawson and Son, Lincoln. The last mentioned and well-known firm show single, double, and treble belting, sewn with wax thread, white lace, or copper wire. They exhibit also specimens of round banding, from $\frac{3}{16}$ to $\frac{3}{8}$ of an inch in diameter, as well as endless leather bands for portable engines, and leather hose for fire and ship purposes.

Dyeing and Staining.

Some Remarks on the Theory of Dyeing. E. Schunck, Journ. Soc. Chem. Ind., Dec. 31, 1888.

The art of dyeing may be described as the art of imparting colours of various kinds to animal or vegetable fibres or tissues of such degree of fixity as not to be removable by mere washing with water or mechanical friction. In order that a material of any kind may be dyed, it must be porous—*i.e.*, capable of receiving colour within its substance, and not merely on its surface. When the colour lies on the surface only, the object is stained or painted, not dyed. Because slate is not porous, it could only be painted; a piece of wood, on the other hand, might be dyed with especial facility when it is impregnated with colouring matter or tannin. A blot of ink on a stone surface gradually becomes darker on drying and exposure to the air, but the result is merely a superficial stain; applied to cotton or linen, however, ink (*i.e.*, inks from galls) penetrates into the interior of the fabric, and there, becoming changed by exposure to the air, acts as a true dye. When ultramarine or any other pigment is fixed to any fabric by means of coagulated albumen, the fabric cannot, in a true sense, be said to be dyed, any more than the paper of a printed book in the places that appear black, or the canvas serving as the basis of an oil painting can be called dyed. If ultramarine could be produced by impregnating a tissue with some material, and then allowing it to be acted on by some other material, so that the colour should be produced within the substance of the tissue, then the latter might be said to be dyed with ultramarine. Whether an object which is to be dyed should not only be porous, but should also be of organic origin, and have, moreover, either as regards the whole or the minute parts of which it consists, an organic structure, is a point on which it is difficult to pronounce a decided opinion. The process of dyeing is a purely artificial one—it never takes place in nature. The colours which we see adorning various animal or vegetable organisms are due (when not caused by the peculiar structure of the superficies) to substances situated in the interior of each organism, and appearing through the generally colourless epidermis or cuticle, but, in no way combined with the matter of which the organs or their contents consist. The green colour of fresh leaves and the various colours of flowers are due to substances contained in the cells, which may easily be removed by water or spirits of wine, leaving the structure colourless. The colourless matter of blood, too, seems to exist in the animal organism in a free and uncombined state. The most important and useful colouring matters of vegetable origin, employed in the arts, do not pre-exist as such in the organism; they are produced from so-called "chromogens," mostly colourless substances formed by the plant, which, by appropriate treatment, yield colouring matters such as the dyer can use. To this class belong the colouring matters of indigo, madder, and orchil. No one, looking at a leaf of indigofera or any indigo-yielding plant, would suspect in it the presence of any colouring matter beyond the ordinary leaf green or chlorophyll; but let the leaf be frozen or subjected to mechanical injury of any kind so as to destroy its vitality, then the colourless chromogen of the leaf of indican begins to decompose, yielding blue indigo, which, as it is being formed, colours and dyes the tissues with which it is in contact. Changes of a similar character are observed during the formation of other colouring matters. The process of dyeing being an entirely artificial one, in which vitality plays no part, and which must depend solely on physical and chemical principles, it seems strange that, in spite of the great advances made by science and its applications during the last 50 years, the subject should still be involved in obscurity, and that we should still be without a satisfactory theory of dyeing. This state of things may be owing to several causes. In the first place, when an art like that of dyeing has attained to a high degree of perfection through the exertion of generations of practical workers—as may be seen in the case of the Turkey-red dye which was produced ages ago of an excellence, as regards brilliancy and permanence, such as cannot even in our days be surpassed—we are apt to rest content with the results achieved without troubling ourselves about the principles involved. Compare in this respect the art of dyeing with that of photography. The latter art arose in scientific days; it was founded on a knowledge of chemical principles, and almost every step in its progress has received some kind of explanation. Secondly, the art of dyeing deals largely with compounds derived from animals and plants, so-called organic substances, bodies of a complex nature, the mere external properties of which, in a state of purity, as well as their behaviour towards reagents, were until recently quite unknown. Thirdly, the materials or fabrics to be operated on and dyed are of a still more complex nature even than the colouring matters which serve to dye them; their constitution is unknown; they may even be mixtures of several substances which cannot be separated one from the other by any known process. Moreover, they are not only organic in constitution—*i.e.*, consisting of C, H, and O, with or without N, but they are organised—*i.e.*, they possess a structure derived from the organisms of which they at one time formed a part, and it is, therefore, possible that different portions, such as the internal and external surfaces of the individual fibres of which they consist, may act differently. It is scarcely surprising, therefore, that in such questions as these:—Is the process of dyeing a purely chemical process? If not, is it merely mechanical, or do mechanical and chemical causes concur in producing the effects observed? or, Is there, perchance, some principle involved in the operation of dyeing of which we are at present ignorant? To such questions no definite answer can be returned. The first to propose what may be called a theory of dyeing was Hellot, who says in his "Art de la Teinture, 1750":—"I believe we may lay it down as a general principle of the art which I treat, that the whole invisible mechanism of dyeing consists in dilating the pores of the body to be dyed, in depositing in them the particles of a foreign substance, and retaining them there by a kind of cement, which neither rain-water nor the rays of the sun can alter, in choosing colouring particles of such tenuity that they may be retained properly encased in the pores of the substance, opened by the heat of boiling water, then contracted by cold, and, moreover, coated by a kind of varnish, which the salt employed in preparing the stuffs has left in the pores; from this it follows that the pores of the fibres of wool, which we have formed, or mean to form, into stuffs, ought to be cleansed, enlarged, varnished, and then contracted, so that the colouring particle may be retained like a diamond in the beasel of a ring." Another author belonging to the same period—Le Pileur d'Apligny—explained the phenomena under consideration in a similar manner, laying particular stress on the different sizes of the pores in the fibres of wool, silk, and cotton, as explaining the differences in the behaviour of these fibres to colouring matters. Considering that at the period when these authors wrote, chemical science was distinct from alchemy could scarcely be said to exist, it can hardly be matter for surprise that they should have adopted a purely mechanical theory of the phenomena of dyeing. To this, perhaps even an earlier, period we owe the term "mordant" as applied to substances used to fix colouring matters on fibres, and supposed to act by their power of eating into the material to be dyed, and fitting it for the reception of colouring matter. The name has been retained, though the notion on which it was founded has been given up and is now ridiculed, simply because it is convenient to have a definite name, however inappropriate, for a distinct thing. Bergman and Berthollet, who belonged to a later period, when chemical science had advanced considerably, and who were themselves distinguished chemists, entirely rejected the views of their predecessors, and, in their works on dyeing, set up a new theory, according to which the fixation of colouring matter on animal and vegetable fibres is a purely chemical

process. Bergman seems to have been the first who referred the phenomena of dyeing entirely to chemical principles. Having dyed wool and silk in a solution of indigo in sulphuric acid, he attributed the effects that he observed in this operation to the precipitation occasioned by the greater affinity subsisting between the wool and silk and the blue particles than between the same particles and the acidulated water. Referring to this view of Bergman, Berthollet makes the following remarks:—"This is the proper method of considering the phenomena of dyeing; they are true chemical phenomena, which ought to be analysed, like all those that depend upon the action which bodies exert in consequence of their peculiar nature. Colouring particles have chemical properties which distinguish them from all other substances; they have affinities which are peculiar to themselves; in consequence of these affinities they combine with acids, alkalies, metallic oxides, and some earths. We may compare the compounds that are formed to neutral salts, which possess properties different from those of their component parts, but in which one of the component parts may become superabundant." These are views that we should expect from a chemist of that period relative to the phenomena of dyeing. Berthollet makes no distinction between the two cases of the fixation of colouring matters on tissues, in the one case with and in the other without the intervention of a mordant; in all cases there was a chemical union either of combined or uncombined colouring matter with animal or vegetable fibre. To Berthollet—who had less precise notions of chemical combination than we have; never admitting, for instance, that bodies united indefinite proportions—such views presented no difficulty. To him, probably, the fixation of indigo on tissues in dyeing was as much a case of chemical combination as the union of sulphuric acid with potash. I am not sure whether he would not have considered the removal of colouring matters from solutions by means of animal charcoal as due to chemical affinity. Similar views to those of Berthollet will be found in other works of that period on dyeing. Dr. Thomas Henry, of Manchester, says ("considerations on Different Materials as Objects of the Art of Dyeing"): "The whole business of dyeing is indeed so truly a chemical process, or rather a combination of several chemical processes, that I am convinced the invention, or at least the principal improvements of the fundamental parts, must have proceeded from men skilled in chemistry." The same notions will be found in Bancroft's "Philosophy of Permanent Colours." We owe to Bancroft the terms substantive and adjective colouring matters, the former being such as "require no basis or mediating substance to fix them upon other objects"; the latter, those "whose durability depends chiefly, if not exclusively, upon the intervention of some basis." These terms might with advantage be retained. In his elaborate memoirs on dyeing. Chevreul gives expressions to opinions very similar to those of his predecessors. He does, indeed, admit that dyes may be of three kinds one in which the colour adheres mechanically to the tissue, another in which it is fixed in virtue of chemical attraction, and a third kind where the colour is fixed partly by affinity and partly only mechanically; but when we come to read attentively what he says, we find that he considers the colouring matter in the first case to lie simply in the interstices of the tissue, just as dust would in the crevices of a wooden board; whereas, in the second case, which is that of a dye in a true sense, chemical affinity, and that only, comes into play. One quotation from Chevreul's eighth memoir on the chemistry of dyeing will suffice to show on what, in his opinion, the effects produced in dyeing processes depend. He says:—"I may remark that, while permitting the expression mordant in the language of the workshop, I would banish it entirely from the language of science, not only because it is wanting in precision but also, because it might, in some cases, lead to confusion. In every case of dyeing, therefore, due to affinity, I only take into consideration a tissue and a coloured substance more or less complex which combines with it in virtue of forces which we call chemical." How very wide Chevreul's definition of chemical affinity must have been may be inferred from what he states in his ninth memoir—"I have proved," he says, "by experiment, that charcoal combines the sulphide of sodium with bases, and with hydrochloric acid in virtue of chemical affinity." In his eleventh memoir, .1861) Chevreul repeats what he had advanced in previous memoirs—viz., that "the colouration of tissues may take place, not only in virtue of affinity but, also, in virtue of their impregnation by a coloured powder introduced mechanically into the interstices of the filaments." The latter kind of colouration manifestly differs very widely from that produced by a colouring matter like indigo, which unites, it may be mechanically or by surface attraction, with the substance of the tissue, and does not merely lie in the interstices. Persoz devotes a chapter of his "Traité de l'Impression des Tissues" to this question. Persoz asserts that there is no essential difference between cohesion and affinity; that the force which causes two bodies of different properties, such as a metal and oxygen, to combine, is the same as that which unites two bodies of similar properties, such as copper and zinc, the difference being merely one of degree. When two bodies placed in simple juxta-position combine, it is because they have the same atomic volume. In the case of the fixation of colouring matters, a chemical compound, such as indigo-blue or a madder lake, having been formed, it is only necessary that it should in the nascent state be placed in immediate juxta-position with the tissue, for the two to unite to form a dyed fabric. The conclusion to be drawn from the facts mentioned by Persoz would seem to be this:—That the union of a colouring matter with a base or mordant is caused by chemical affinity, whereas the fixation of the compound or vegetable or animal fibre is mechanical. The removal of a colouring matter from a watery solution by means of charcoal is not due, according to Persoz, to the same cause as the combination of colouring matter with a metallic oxide. This is no doubt true; but, on the other hand, it is not easy to see in what respect charcoal and fibre differ in their behaviour to colouring matters. The difference is only one of degree, and, if we are not particular as to definition, we may say that both act in virtue of their affinity for colouring matter. Views differing very widely from those previously held were made known in a series of memoirs "On the Manner in which Cotton unites with Colouring Matter," by Mr. Walter Crum, published in 1843–63. After alluding to the opinions of predecessors on the principles involved in the fixation of colouring matters, Mr. Crum says:—"Cotton wool in the bleached state may be considered as pure woody fibre or cellulose. It is one of the most inert of vegetable bodies. In the textile fabric it is capable of having incorporated with it, in all proportions, a multitude of different substances, without changing its own or their physical or chemical characters, except by holding them against mechanical efforts to wash away or otherwise to separate them, but yielding them up to their proper solvents as readily as they could be taken from a surface of glass." After comparing the attraction exerted by cotton fibres for colouring matters to that of charcoal for gases and bodies held in watery solution, he proceeds to say that substances applied to cotton as dyes, or for the purpose of attracting dyes, become fixed in the cotton fibre in two different ways—viz., (1) They are attracted and precipitated from their solutions by the pores of the cotton; or, (2) They enter these pores in combination with an acid or other solvent, and in a state of solution, and are there fixed, not by an effect of porosity but, by a subsequent removal of this solvent, or by other means which render them insoluble in water. To the processes comprised under the first heading, of which dyeing with indigo affords an example, Mr. Crum paid but little attention, confining himself principally to those of the second class. In illustration of his views, he takes the case of dyeing cotton black or purple with madder, which consists in the main in applying an iron mordant—usually ferrous acetate—to the tissue, where it is fixed in the form of ferric oxide, before entering the dyebath. Having confirmed the statements of previous observers to the effect that cotton fibres, when examined under the microscope, are found to consist of tubes having interior cavities more or less large, he maintains that, in the first part of the process alluded to, the ferrous acetate solution enters the cavities; after passing through the walls of the tubes, and the fabric being allowed to dry, and then exposed to an atmosphere slightly warm and moist, the acetic acid gradually escapes in proportion as oxygen is absorbed, and the iron, in the state of an insoluble peroxide, remains. "But as insoluble matter cannot pass into the interior of the fibre from without, so, when the substance has once entered that fibre, or its pores, in a state of solution, and has become precipitated within these enclosures, it is equally impossible for the precipitate to return. It is entrapped within the body of the fibre or its tissue, and becomes fixed there. It will be seen that this precipitation and imprisonment of the oxide is no case of attraction, either chemical or mechanical. It is a case of chemical decomposition, in which the cotton acts only as a vessel to receive the materials. The same solution, spread thinly over glass, and placed in similar circumstances, undergoes the same decomposition. The cloth having thus been furnished with its mordant, is first passed through hot water, etc., after which it is ready to be dyed. For that purpose it is made to traverse, for a couple of hours, a vessel of water through which madder in powder has been distributed. Heat being gradually applied, the colouring matter of the madder disolves slowly and passes into fibre which encloses the oxide of iron, and there unites with it. The resulting compound is a purple lake. This last process is a purely chemical one, in which the oxide of iron forms a true combination with the colourable matter of the madder, the cotton attenuating the iron to a prodigious extent, and placing it in circumstances the most advantageous for forming a lake with the dye-stuff." When aluminium acetate is employed in place of ferrous acetate, similar changes take place, alumina being left in the cavity of the fibre, and the tissue acquiring a red colour on dyeing with madder. After applying aluminium or ferric chloride containing a large excess of alumina or ferric oxide respectively to cotton, their remains, after simply steeping and washing, sufficient alumina or ferric oxide for dyeing purposes. This, according to Mr. Crum, is done to the crystalloid portion of the mordant, the aluminium or ferric chloride, diffusing through the wall of the fibre into the surrounding water, while the colloid hydrated alumina or ferric oxide remains within, gelatinised either spontaneously or by the traces of saline matter which are always present. In the so-called "dead cotton," which is simply immature cotton, no cavity can be seen under the microscope in the interior of the fibre. For this reason, according to Mr. Crum, this kind of cotton will not take any colour when subjected to the same process as ordinary mature cotton. Appended to Mr. Crum's last memoir are several plates, showing the appearance of dyed cotton fibres of various colours, and illustrating his meaning in the clearest manner. These views of Crum, which remind one somewhat of those held by Hellot more than a century ago, were subjected to a somewhat severe criticism by Persoz, some of whose objections are certainly well founded, though others are of little importance.—*Journal of the Society of Dyers and Colourists.*

(To be continued).

Tariff Changes and Import Duties.

FOREIGN IMPORT DUTIES ON WOOLLEN AND WORSTED YARNS.

The following statement, which shows the rates of Customs duty levied in each of the undermentioned countries upon the importation of Woollen and Worsted Yarns from the United Kingdom, has been prepared in the Department for publication in the *Board of Trade Journal*.

NOTE.—Since the publication of the return relating to Foreign Import Duties (178/85), numerous modifications have been effected in Customs Tariffs of various foreign countries; these modifications, in so far as regards Woollen and Worsted Yarns, have been embodied in the following statement:—

Tariff Classification in each Country.	Rates of Duty.	English Equivalents.
	Rbls. Cop.	£ s. d.
RUSSIA:—		
Of wool or hair of all kinds, pure or mixed with cotton, flax, or hemp:—		
Undyed	Poud 7·50	Cwt. 3 13 11
Dyed	,, 9·00	,, 4 8 8
	Kron. Öre	
SWEDEN:—		
Undyed and unbleached	Kilog. 0·20	Cwt. 0 11 4
Dyed, bleached, or printed (including lustre yarn)	,, 0·35	,, 0 19 9
	Kron. Öre	
NORWAY:—		
Undyed	Kilog. 0·13	Cwt. 0 7 4
Dyed or mixed with metal threads	,, 0·20	,, 0 11 4
	Kron. Öre	
DENMARK:—		
Undyed	Pund 0·08½	,, 0 9 5
Dyed or mixed with metal threads	,, 0·16½	,, 0 18 10
	Mks. Pf.	
GERMANY:—		
Pure or mixed with other materials, except cotton:—		
Single, unbleached	100 kilos. 8·00	Cwt. 0 4 0½
Double ,,	,, 10·00	,, 0 5 1
Single, bleached or dyed	,, 12·00	,, 0 6 1
Double, bleached or dyed; also twisted in three or more strands, unbleached, bleached, or dyed	,, 24·00	,, 0 12 2
Alpaca, genappe, and mohair yarn:—		
Single, undyed or dyed; also double, undyed	,, 3·00	,, 0 1 6½
Double, dyed: also twisted in three or more strands, undyed or dyed	,, 24·00	,, 0 12 2
HOLLAND:—		
Pure, or mixed with cotton:—		
Twisted, of more than two threads, dyed or undyed	3 % *ad. val.* Free.	3 % *ad. val.* Free.
Other kinds		
BELGIUM:—		
Of wool, alpaca, llama, vicuna, or goats' or camels' hair:—	Frs. Cts.	
Not twisted nor dyed	100 kilos. 20·00	Cwt. 0 8 2
Twisted or dyed	,, 30·00	,, 0 12 2
Note.—Woollen and assimilated yarns mixed with cotton or other materials pay as woollen yarns, provided the wool or assimilated material predominates in weight.		
FRANCE:—		
Of pure wool:—		
Single, unbleached or bleached, but not dyed:—		
Combed yarns measuring to the kilogramme 30,500 metres or less	Frs. Cts. 100 kilos. 20·00	Cwt. 0 8 2
From 30,500 to 40,500 metres	,, 28·00	,, 0 11 5
,, 40,500 to 50,500 metres	,, 36·00	,, 0 14 8
,, 50,500 to 60,500 metres	,, 44·00	,, 0 17 11
,, 60,500 to 70,500 metres	,, 52·00	,, 1 1 2
,, 70,500 to 80,500 metres	,, 60·00	,, 1 4 5
,, 80,500 to 90,500 metres	,, 68·00	,, 1 7 8
,, 90,500 to 100,500 metres	,, 76·00	,, 1 10 11
Above 100,500 metres	,, 80.00	,, 1 12 6
Carded yarns, measuring to the kilogramme 10,000 metres or less	,, 12·00	,, 0 4 10½
From 10,000 to 15,000 metres	,, 18·00	,, 0 7 4
,, 15,000 to 20,000 metres	,, 24·00	,, 0 9 9
,, 20,000 to 30,500 metres	,, 29·50	,, 0 12 0
Above 30,500 metres	,, 36,00	,, 0 14 8
Twisted for weaving, unbleached or bleached, but not dyed:—		
Combed yarns, measuring to the kilogramme 30,500 metres or less of single yarn	100 kilos. 24·00	Cwt. 0 9 9
From 30,500 to 40,500 do.	,, 33·60	,, 0 13 8
,, 40,500 to 50,500 do.	,, 43·20	,, 0 17 7
,, 50,500 to 60,500 do.	,, 52·80	,, 1 1 6
,, 60,500 to 70,500 do.	,, 62·40	,, 1 5 4
,, 70,500 to 80,500 do.	,, 72·00	,, 1 9 3
,, 80,500 to 90,500 do.	,, 81·60	,, 1 13 2
,, 90,500 to 100,500 do.	,, 91·20	,, 1 17 1
Above 100,500 metres do.	,, 96·00	,, 1 19 0
Carded yarns, measuring to the kilogramme 10,000 metres or less of single yarn	,, 14·40	,, 0 5 10
From 10,000 to 15,000 do.	,, 21·60	,, 0 8 9
,, 15,000 to 20,000 do.	,, 28·80	,, 0 11 8
,, 20,000 to 30,500 do.	,, 35·50	,, 0 14 5
Above 30,500 metres do.	,, 43·20	,, 0 17 7
Twisted for weaving, dyed; combed or carded	25 frs. per 100 kilos. (10s. 2d. per cwt.) above the duty on undyed, according to class.	
Twisted, for tapestry; unbleached or bleached, but not dyed:—		
Combed, measuring to the kilogramme 30,500 metres or less of single yarn	100 kilos. 30·00	Cwt. 0 12 2
From 30,500 to 40,500 do.	,, 42·00	,, 0 17 1
,, 40,500 to 50,500 do.	,, 54·00	,, 1 1 11
,, 50,500 to 60,500 do.	,, 66·00	,, 1 6 10
,, 60,500 to 70,500 do.	,, 78·00	,, 1 11 8
,, 70,500 to 80,500 do.	,, 90·00	,, 1 16 7
,, 80,500 to 90,500 do.	,, 102·00	,, 2 1 5
,, 90,500 to 100,500 do.	,, 114·00	,, 2 6 4
Above 100,500 metres do.	,, 120·00	,, 2 8 9
Twisted, for tapestry, dyed	25 frs. per 100 kilos. (10s. 2d. per cwt.) above the duty on undyed, according to class.	
Note 1.—Yarns of alpaca, llama, vicuna, and camels' hair pay as yarns of pure wool.		
Note 2.—Woollen yarns mixed with other materials as cotton, linen, &c., pay as woollen yarns, provided the wool predominates in weight.		
Yarn of goats' hair	100 kilos 24·00	Cwt. 0 9 9
	Reis.	
PORTUGAL:—		
All kinds, except for embroidery:—		
Bleached	Kilog. *470	Cwt. 5 7 6
Dyed	,, *750	,, 8 11 6
For embroidery, bleached	,, 1,305	,, 14 18 5
Do., dyed	,, 2,120	,, 24 4 9
	Pes. Cts.	
SPAIN:—		
Raw or in the grease	Kilog. 1·00	Cwt. 2 0 8
Cleaned or bleached	,, 1·65	,, 3 7 1
Dyed	,, 1·95	,, 3 19 3
	Lire Cts.	
ITALY:—		
Carded yarns:—		
Single:—		
Unbleached; measuring up to 10,000 metres per kilogramme	100 kilos. 45·00	Cwt. 0 18 3
Do. measuring above 10,000 metres per kilogramme	,, 55·00	,, 1 2 4
Bleached	20 % above duty on unbleached, according to class.	
Dyed	25 lire per 100 kilos. (10s. 2d. per cwt.) above the duty on unbleached, according to class.	
Twisted; unbleached, bleached or dyed	17 lire per 100 kilos. (6s. 11d. per cwt.) above the duty on single, according to class.	
Combed yarns:—		
Single:—		
Unbleached, measuring up to 50,000 metres per kilogramme	100 kilos. 60·00	Cwt. 1 4 5
Do., measuring above 50,000 metres per kilogramme	,, 75·00	,, 1 10 6
Bleached	20 % above the duty on unbleached, according to class.	
Dyed	25 lire per 100 kilos. (10s. 2d. per cwt.) above the duty on unbleached, according to class.	

* In addition to these rates, a tax of 3 % upon the duty is payable for Custom House fees, and a further 2 % *ad valorem* for harbour works. These additions would raise the total duties payable to about 510 reis and 810 reis per kilogramme on bleached and dyed yarns respectively.

Tariff Classification in each Country.	Rates of Duty.	English Equivalents.
ITALY—*continued.*		
Twisted	17 lire per 100 kilos. (6s. 11d. per cwt.) above the duty on single, according to class.	
AUSTRIA :—		
Yarns of wool or animal hair and vicuna yarns :—		
Yarns of coarse animal hair (horned cattle hair, &c.) up to No. 5 metrical, single or double, raw	Fls. Kr. 100 kilos. 8·00	£ s. d. Cwt. 0 8 2
Mohair, alpaca, and genappe yarns; hard combed yarns (weft yarns) above No. 30 metrical, single or double, raw; imported at specially authorised Custom houses	,, 1·50	,, 0 1 6½
All other woollens, &c., yarns :—		
Single, unbleached :—		
Up to No. 45 metrical	,, 8·00	,, 0 8 2
Above No. 45	,, 12·00	,, 0 12 2
Twisted, of two or more threads, unbleached :—		
Up to No. 45 metrical	,, 12·00	,, 0 12 2
Above No 45	,, 14·00	,, 0 14 3
Single, bleached, dyed or printed :—		
Up to No. 45 metrical	,, 12.00	,, 0 12 2
Above No. 45	,, 16·00	,, 0 16 3
Twisted, of two or more threads, bleached, dyed or printed :—		
Up to No. 45 metrical	,, 16·00	,, 0 16 3
Above No. 45	,, 20·00	,, 1 0 4
Note 1.—Single or double mixed yarns, dyed, pay	,, 12·00	,, 0 12 2
Note 2.—Carpet warps, printed, with permits, and under fulfilment of the conditions and measures of control prescribed by the Government, pay	,, 12·00	,, 0 12 2
SWITZERLAND :—	Frs. Cts.	
Single or double, unbleached, combed or carded	100 kilos. 5·00	Cwt. 0 2 0½
Twisted, of three or more threads, unbleached, combed, or carded	,, 8·00	,, 0 3 3
Bleached, combed, or carded	,, 8·00	,, 0 3 3
Dyed, ,, ,,	,, 9·00	,, 0 3 8
In spools, balls, or skeins, prepared for retail sale :—		
Unbleached, single or double	,, 5·00	,, 0 2 0½
Bleached, twisted of two or more threads	,, 8·00	,, 0 3 3
Dyed	,, 9·00	,, 0 3 8
GREECE :—	Drs. Lep.	
Unbleached, single or twisted	Free.	Free.
Bleached or dyed, single or twisted	Oke 5·40	Cwt. 8 12 10
Yarns employed in the manufacture of fezes, dyed in oil, not twisted	Free.	Free.
TURKEY :—		
All kinds	8 % *ad val.*	8 % *ad val.*
ROUMANIA :—	Lei. B.	
All kinds, undyed	100 kilos. 90·00	Cwt. 1 16 7
Do., dyed of any colour	,, 150·00	,, 3 1 0
UNITED STATES :—		
Woollen and worsted yarns :—	Dols. Cts.	
Valued at, not exceeding 30 cents per lb.	Lb. 0·10	Cwt. 2 6 8
Do., above 30 cents and not exceeding 40 cents per lb.	,, 0·12	,, 2 16 0
Do., above 40 cents and not exceeding 60 cents per lb.	,, 0·18	,, 4 4 0
Do., above 60 cents and not exceeding 80 cents per lb.	,, 0·24	,, 5 12 0
Do., above 80 cents per lb.	,, 0·35 and 40 % *ad val.*	,, 8 3 4 and 40 % *ad val.*

And 35% *ad val.*

The following decisions affecting the classification of articles in the Customs tariff have recently been given by the Customs authorities :—

ITALY.—Long cloaks, with sleeves, for men, made of carded wool tissue, of the weight of more than 200, but less than 500 grammes per square metre, trimmed with coloured silk over less than one-tenth of the surface. Duty, 520 lire per quintal, with an additional of 40 per cent. for the sewing. Small cotton shawls not sewn, and the same sewn, with fringe of wool, both having, near the border, lines which have resulted from the simple distribution of the yarn in woof and warp, obtained with common tissues, without the aid of the Jacquard loom, the shawls not sewn and without fringe are classified at the rate of 135 lire per quintal. Those which are sewn and with fringe pay a duty of 220 lire per quintal, with an increase of 50 per cent. for the sewing. Small shawls of carded wool, having on the edge a fringe obtained from the same tissue, by means of unravelling, and upon which an impression is made, which produces the effect of curling the yarn—Duty, 300 lire per quintal, with an addition of 50 per cent. established by the differential tariff. English cotton tulle, hemmed—Duty, 260 lire per quintal, with an addition of 40 per cent. for the sewing.

SWITZERLAND.—Bows for caps of cotton tissues without needlework or embroidery—Duty 35 francs per quintal. Shawls, &c., of cotton bobbinet, without needlework—Duty 50 francs per quintal.

UNITED STATES. — So-called "woollen waste," which consists of scoured and purified wool in the form either of broken tops, or of broken tops with a slight admixture of thread or other waste, is held to be dutiable at the rate of 60 cents per pound as scoured wool imported in other than the ordinary conditions.

MARTINIQUE.—Import duties in Martinique are collected under three heads :—(1) Customs duties on goods other than of French origin ; (2) Consumption duties on goods without distinction of origin ; and (3) Maritime octroi dues (*octroi de mer*) on goods also of any origin. The following statements show the rates of duty applicable under each of the above heads.

NOTE.—Kilogramme = 2·204 lbs. avoirdupois, Metre = 3·28 feet.
Franc = 9 5/16 d.

1. *Customs Duties on Goods other than of French Origin.*

TISSUES.	Frs. Cts.
Cotton tissues :—	
Handkerchiefs, Indian, &c., known as "Madras"	Piece of 8 handkerchiefs 3·00
Do., do., known as "Madapolam"	,, 1·50
Do., others of any kind, in the piece or not, with or without embroidery	12 handkerchiefs 0·36
Small wares, ribbons, lace, blonds, gimp-lace, tulles, embroideries, wicks, oil cloth, millinery, clothes, linen, and all other articles made up wholly or in part, or made other than in the piece	6 % *ad val.*
Others, in the piece, single width	Metre 0·05
Do., do., double width*	,, 0·08
Linen or hemp tissues, pure or mixed :—	
Handkerchiefs of every kind, in the piece or not, with or without embroidery	12 handkerchiefs 0·90
Small wares, ribbons, lace, blonds, gimp-lace, tulles, embroideries, oil-cloth, millinery, clothes, linen, and all other articles made up wholly or in part, or made other than in the piece	9 % *ad val.*
Others, in the piece, single width	Metre 0·12
Do., do., double width*	,, 0·18
Wool or hair tissues, pure or mixed :—	
Cloth, figured or plain	,, 0·50
Small wares, ribbons, lace, millinery, carpets, clothes, and all other articles made up wholly or in part, or made other than in the piece	10 % *ad val.*
Other, in the piece, single width	Metre 0·20
Do., do., double width*	,, 0.30
Silk or silk waste, pure or mixed :—	
Handkerchiefs	Piece of 7 handkerchiefs 3.00
Small wares, ribbons, lace, blonds, tulles, millinery, clothes, and all other articles made up wholly or in part, or made other than in the piece	15 % *ad val.*
Other, in the piece	Metre 0·85
Of vegetable fibres, not distinguished	10 % *ad val.*

2. *Octroi de mer duties on Articles of any Origin.*

YARNS.	
Yarns :—	
Of cotton	2 % *ad val.*
Of linen or hemp	3 % *ad val.*
Of wool	4 % *ad val.*
Of silk	7 % *ad val.*
Of any kinds worked with gold or silver	8 % *ad val.*

TISSUES.	
Cotton tissues :—	
Handkerchiefs of any kind, in the piece or not, with or without embroideries	12 handkerchiefs 0.12
Small wares, ribbons, lace, blonds, gimp-lace, embroideries, tulles, wicks, oil cloth, millinery, clothes, linen, and all other articles made up wholly or in part, or made other than in the piece	2 % *ad val.*
Others, in the piece, single width	Metre 0.015
Do., do., double width†	,, 0·025
Linen or hempen tissues, pure or mixed :—	
Handkerchiefs of any kind, in the piece or not, with or without embroidery	12 handkerchiefs 0·30
Small wares, ribbons, lace, tulle, gimp-lace, embroideries blonds, oil cloth, millinery, clothes, linen, and all other articles made up wholly or in part, or made other than in the piece	3 % *ad val.*
Others, in the piece, single width	Metre 0.04
Do., do., double width†	,, 0.06
Of wool or hair, pure or mixed :—	
Cloth, figured or plain	,, 0,20
Small wares, ribbons, lace, blonds, tulles, millinery, clothes, and all other articles made up wholly or in part, or made other than in pieces	4 % *od val.*

Others, in the piece, single width	Metre	0·08
Do., do., double width†	,,	0.12
Of silk or silk waste, pure or mixed :—		
Handkerchiefs	7 handkerchiefs	2·00
Small wares, ribbons, lace, blonds, tulles, millinery, clothes, and all other articles made up wholly or in part, or made other than in the piece	7 % *ad val.*	
Other, in the piece	Metre	0·40
Of vegetable fibres not mentioned above, and of hair	4 % *ad val.*	
MISCELLANEOUS MANUFACTURES.		
Umbrellas and parasols :—		
Of silk, pure or mixed	Each	0·60
Of wool or cotton	,,	0·15

* Is considered as double width that which exceeds a metre. For clothes, linen, and other articles made up wholly or in part of different tissues, the duty on the tissue paying the highest duty is applicable.

† Is considered as double width that which exceeds one metre.

ORIGINAL DESIGNS.

On our first plate, we give a design for a Table Cover. This is shown half-size, and has been drawn by Mr. F. Layton, York Terrace, Akroydon, Halifax.

* * * *

On our second, we give a pattern for a Printed Blind, which would be effective in three colours. This has been drawn by Mr. R. T. Lord, 10, Ann Place, Bradford.

* * * *

Our third plate shows a design for a Toilet Cover. It is also suitable for other purposes, and would do well for a Linen Table Cover. As a suggestion for Bordered Dress Goods also, we may draw attention to it. This has also been drawn by Mr. R. T. Lord.

MONTHLY TRADE REPORTS.

WOOL.—Colonial wools have sold very freely at top prices during the past month. English wools have also sold fairly well, but staplers complain of the exceeding difficulty they have in making a profit, as farmers ask, in many cases, higher rates than are prevalent in the manufacturing districts. It is stated that in the Bedford district prices have ruled ¼d. to ½d. per lb. higher than in Bradford. New wool has commenced to come in, and is generally in good condition. The yarn branches have been good, spinners of most descriptions having been extremely busy, and especially has this been the case in soft yarns, for which there has been a decided run recently. In two-folds, both worsted and mohair, the demand has been exceptionally good. Prices have generally ruled higher, and spinners decline new orders unless at an advance. The piece trade has been fairly good. although the season for the home trade is far advanced. Fancy goods still keep a hold on the markets both for home and foreign account, the Americans, especially, having bought freely of this class recently. Prices have a firmer tendency.

COTTON.—The sales of raw cotton have been about on an average and prices have shewn little change; if anything rates have ruled slightly easier. The yarn branches have been generally quieter, and it has been with difficulty that spinners have kept up prices. Many large orders have recently been completed, and, generally, to secure new contracts, rather lower rates have had to be accepted. This especially applies to yarns for India, China and Japan and in a lesser degree to the home trade. On the other hand, a slight improvement in demand and rates has been experienced for the Continent for yarns in cask and bundle. Manufacturers have used much caution recently in their transactions, only buying for actual requirements. In piece goods, many offers have been made for India, but, prices being low, not much business has resulted, still, fair orders have been booked in shirtings for that country. The demand for shirtings for Japan has improved, with the result that most makers have now orders on hand to last from two to three months. For the Continent and South America, an improvement has also been manifested, and the same may be said of the home demand. Heavy makes of goods keep rather quiet, and, although production has been curtailed, still this fact has not had much effect upon this branch.

WOOLLEN.—Trade in the woollen districts, with some few exceptions, keeps in a very satisfactory condition. Notwithstanding the recent decision in the United States regarding the tariff upon certain classes of worsteds, the exports to that country still keep up, and seem likely to do so for some time to come. The demand for worsteds, both plain and fancy, for other countries and for home consumption is still good, and orders have been recently booked that will keep a great deal of labour employed for some months to come. The same hopeful state of things characterises the better class of Cheviots, tweeds, and such like fabrics, and also the same classes of goods in the lower qualities for the clothing trade. Medium goods do not sell so freely as manufacturers could wish, but still, on the whole, a fair business has been done in these. In mantlings, a moderate demand has been experienced for figured materials, but in this branch the competition is very close, and such as, in low qualities, leaves but a slight margin for profit. Prices generally have kept firm, and the tendency is to rather higher rates.

LINEN.—With the exception of damasks and drills in the higher qualities, the demand for linens has been fairly good. The making of blinds has advanced considerably recently, and these have sold rather freely. Domestic cloths have met with much attention, pantry and such like having sold well. Bordered, twilled, and plain towelings have also had much inquiry, and large quantities of these goods have been disposed of. Prices, with the exception of the best qualities, have improved slightly.

LACE.—This branch of trade is still showing a want of activity; with some few exceptions, manufacturers have their machinery but poorly employed, and in the business done, the competition is very keen, with a consequent lowness of prices. The demand seems to be chiefly for the cheaper varieties of goods—a fact which increases the difficulty of realising a profit. Many complaints are being made by Nottingham employers about the higher rate of wages in that town than is being paid at Long Eaton and other outside localities where non-unionist labour is employed. There seems but slight hopes of any permanent improvement in the Nottingham district for some time to come.

Post Office Notice.

PARCEL POST WITH CANADA.—The maximum weight of parcels for the Dominion of Canada has now been raised from 4 lbs to 5 lbs. The parcel post now extends to all post offices in Canada.

	For a Parcel				
	Not Exceeding 1 Lb.	Exceeding 1 Lb. and not Exceeding 2 Lbs.	Exceeding 2 Lbs. and not Exceeding 3 Lbs.	Exceeding 3 Lbs. and not Exceeding 4 Lbs.	Exceeding 4 Lbs. and not Exceeding 5 Lbs.
	s. d.	s. d.	s. d.	s. d.	s. d.
New Brunswick, Nova Scotia, Prince Edward Island, and the Province of Quebec	1 3	2 6	3 9	5 0	6 3
Province of Ontario	1 5½	2 11	4 4½	5 10	7 3½
North-West Territories and Manitoba	1 8	3 4	5 0	6 8	8 4
British Columbia and Vancouver Island	1 10½	3 9	5 7½	7 6	9 4½

Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of failures in England and Wales gazetted during the four weeks ending Saturday, May 25th, was 377. The number in the corresponding four weeks of last year was 388, showing a decrease of 11, being a net decrease in 1889, to date, of 42. In addition to these gazetted failures, there were 290 Deeds of Arrangement filed at the Bills of Sale Office during the same four weeks. The number filed in the corresponding four weeks of last year was 297, showing a decrease of 7, being a net increase in 1889, to date, of 186. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, May 25th, was 798. The number in the corresponding four weeks of last year was 1,017, showing a decrease of 219, being a net decrease in 1889, to date, of 947. The number published in Ireland for the same four weeks was 48. The number in the corresponding four weeks of last year was 44, showing an increase of 4, being a net decrease in 1889, to date, of 32.

A Reuter's telegram says:—Mr. Windom, Secretary of the Treasury, has affirmed the decision of the Collector of Customs in New York in assessing the duty at 35c. per lb. and 35c. ad valorem upon so-called worsted coatings, suitings, &c., used in the manufacture of men's and boys' clothing. The Minister is of opinion that, as these goods are made partly of wool, it was evidently the intention of the statue that they should be assessed at the rate applicable to manufactures of wool, instead of at the rate under which they were classified." We are informed that the levying of woollen duties upon worsted goods has not seriously affected the Bradford district, practically the only sufferers being the manufacturers of heavy low and shoddy backed worsteds. On good quality worsteds, the change in duties means an increase of 8 per cent. only.

TABLE COVER.

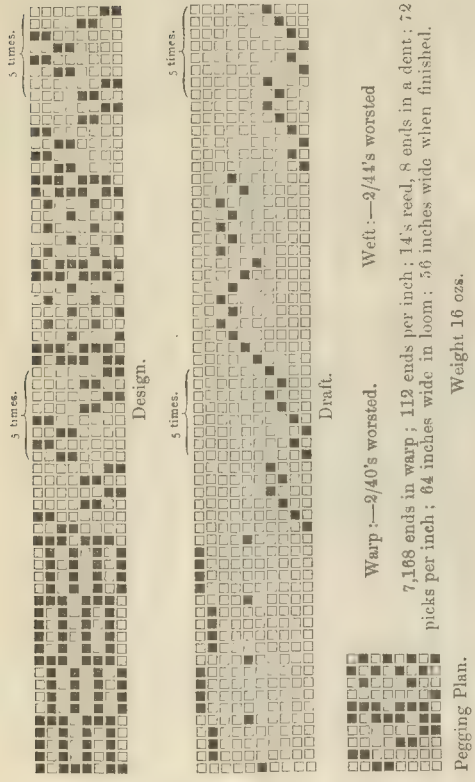
PRINTED BLIND.

TOILET COVER.

Fashionable Designs.

Worsted Trousering.

No. 585.



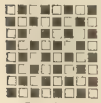
Warp:—2/40's worsted. Weft:—2/44's worsted

7,168 ends in warp; 112 ends per inch; 14's reed, 8 ends in a dent; 72 picks per inch; 64 inches wide in loom; 56 inches wide when finished.

Weight 16 ozs.

Woollen Trouserings or Suitings.

No. 586.


Design.

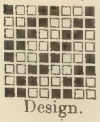
Warp:—			
4	ends	Twist,	9 skeins.
2	,,	Black,	,,
4	,,	Twist,	,,
2	,,	Black,	,,
4	,,	Twist,	,,
2	,,	Black,	,,
4	,,	Twist,	,,
3	,,	Black,	,,

25 ends in pattern.

Weft:—11 skeins, all twist.

1,664 ends in warp; 26 ends per inch; 6½ reed, 4 ends in a dent; 22 picks per inch; 64 inches wide in loom; 56 inches wide when finished. Weight 19½ ozs.

No. 587.


Design.

Warp:—			
1	end	Twist,	9 skeins.
5	ends	Light Grey,	22 ,,
2	,,	Black,	,, ,,
6	,,	Light Grey,	,, ,,
6	,,	Slate,	,, ,,
8	,,	Light Grey,	,, ,,
1	end	Black,	,, ,,
3	ends	Light Grey,	,, ,,

32 ends in pattern.

Weft:—

1 pick	Twist,	9 skeins.
3 picks	Brown,	22 ,,
1 pick	Grey,	,, ,,
24 picks	Brown,	,, ,,
2 ,,	Grey,	,, ,,
5 ,,	Brown,	,, ,,

36 ends in pattern.

3,328 ends in warp: 52 ends per inch; 13's reed, 4 ends in a dent; 54 picks per inch; 64 inches wide in loom; 56 inches wide when finished.

Weight 18 ozs.

Mantle Cloth.

No. 588.


Design.

Warp:—				
1	end	Gold,		24 skeins.
1	,,	White,	3	
1	,,	Brown,	times.	,,
1	,,	White,		,,
1	,,	Gold,		,,
1	,,	White,	11	
1	,,	Brown,	times.	,,
1	,,	White,		,,
1	,,	Green,		,,
1	,,	White,	3	
1	,,	Brown,	times.	,,
1	,,	White,		,,
1	,,	Green,		,,
1	,,	White,	11	
1	,,	Brown,	times.	,,
1	,,	White,		,,

64 ends in pattern.

Weft:—

1	pick	Red,	23 skeins.
1	,,	Grey,	3
1	,,	Black,	times. ,,
1	,,	Grey,	,,
1	,,	Red,	,,
1	,,	Grey,	11
1	,,	Black,	times. ,,
1	,,	Grey,	,,
1	,,	Twist,	,,
1	,,	Grey,	3
1	,,	Black,	times. ,,
1	,,	Grey,	,,
1	,,	Twist,	,,
1	,,	Grey,	11
1	,,	Black,	times. ,,
1	,,	Grey,	,,

64 picks in pattern.

2,112 ends in warp; 33 ends per inch; 11's reed, 3 ends in a dent; 35 picks per inch; 64 inches wide in the loom; 56 inches wide when finished.

Weight 11½ ozs.

Fancy Tennis Cloth.

No. 589.


Design

2,300 ends in warp: 64 ends per inch; 16's reed, 4 ends in a dent; 61 picks per inch; 36 inches wide in loom; 30 inches wide, when finished. Weight 8 ozs.

36 skeins warp and weft.

20 ends	White.	To be made as a stripe.
6 ,,	Light Blue.	Will also be a good pattern checked.
16 ,,	White.	Checking like warping.
4 ,,	Light Brown.	

No. 590.


Design.

2,592 ends in warp; 72 ends per inch; 18's reed, 4 ends in a dent; 70 picks per inch; 36 inches wide in loom; 30 inches wide when finished. Weight 8 ozs.

40 skeins warp and weft.

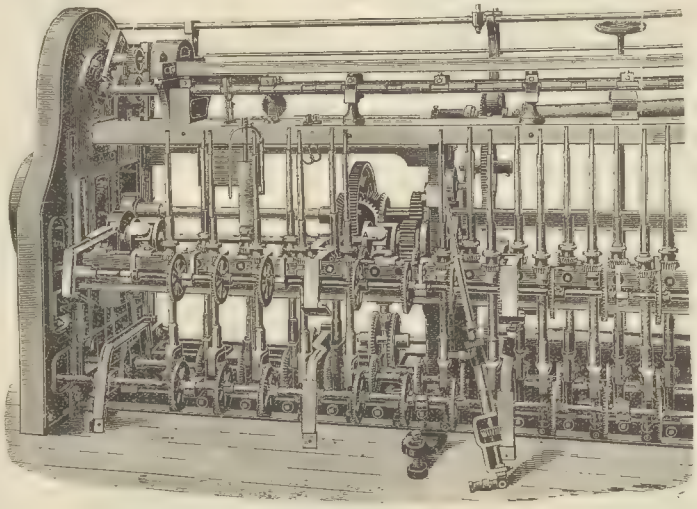
To be made as a stripe and as a check.
Checking like warping.

1	end	Light Slate,	20
1	,,	Dark ,,	times.
1	,,	Light ,,	20
1	,,	,, Brown,	times.

MACHINERY, &c.

Crighton's Patent Express Roving Frames.

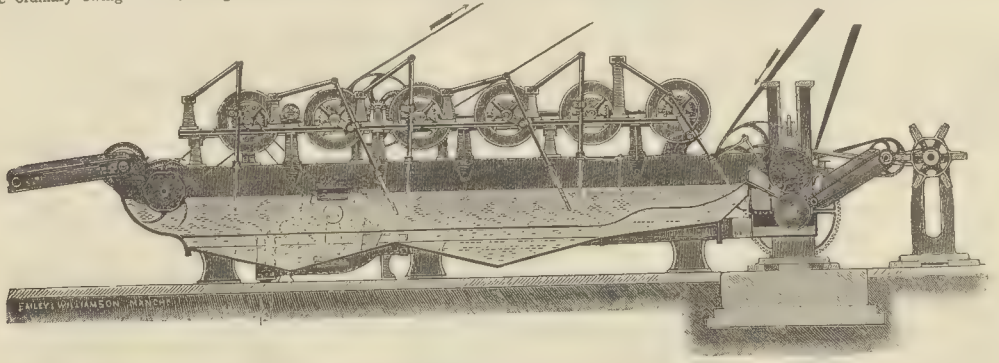
Messrs. Crighton and Sons of Castlefield Iron Works, Manchester, are now developing a large business in the express roving frame which gives the largest production that is possible; and, from the unique construction of the spindle bearings, the highest possible speed of spindles is obtainable. In proof of this, we may add that a frame on this principle shown at the London Exhibition of 1862 produced a 50 hank rove, with the spindles revolving at 2000 per minute, and to testify to the extraordinary durability of these frames at high speed, we are informed by Messrs. Crighton and Sons that this identical frame with its spindles is still running in excellent condition at a mill near Manchester. The "patent long collars, with swivel attachments to rails," on this frame, form one of its chief features, the long collar giving rigidity to the spindle, whilst the swivel attachments provide for the spindles always being in a true vertical position, and as both the spindle and bolster are self maintained, as in the rabbeth spindle, the spindles can be drawn out at will; there being no set screw to spindle pinion, the spindle having its foot squared to fit in a square hole on the pinion, it affords greater facilities for cleaning, oiling, &c.; again, as the bobbin moves up and down outside the "long collar" or "tube," —the tube being fixed—the spindle revolves freely without any possibility of binding in the bolster support. Another notable feature in the aforementioned fixed tube is that, being stationary between the top and bottom rails, it does not attract the "loose fly" as is the case in some other make of frames. We observe too, that a great convenience is gained, especially where a change from coarse to fine rove, or *vice versa*, is required, by the easy access to the change pinions, which can be speedily altered, and it also permits of a wider scope for applying a large range of these wheels. Messrs. Crighton and Sons have also another improvement in their "Perfect Winding on Motion." This they accomplish by a diagonal shaft-driving arrangement, which dispenses with the ordinary swing wheels, and gives more regular winding, with a minimum of thin places in sliver, and entirely obviates the possibility of the irregular tension of the rove betwixt the front roller and the top of the flyer. Another matter to which our attention was drawn was the height of these frames, which is considerably lower than usual, thereby enabling the "back tenters" (usually young girls of from 9 to 14 years of age and, therefore, not of great stature) to creel the bobbins with ease, whilst the frame tenters enjoy equal facilities in "piecing up," "doffing, &c." Messrs. Crighton and Sons are also doing an extensive trade in these frames, not only for spinners of cotton but also, for those of Merino, silk, &c., and it is well worth the attention of the trade to see their other specialities in silk roving and dandy frames.



Crighton's Patent Express Roving Frames.

Wool Washing and Scouring Machine.

We recently had occasion to refer to the wool washing and scouring machine made by Messrs. John Petrie, Jun., Limited, as being the first of its class invented. Of course, since the first machine was made, many necessary improvements have been added, until one would almost suppose that the machine was perfect, particularly when we consider the reputation which it has made for itself. Such, however, was not the case, for it appears that even here a very valuable improvement has been made which cannot but add greatly to the name which the firm have already secured for themselves as makers of wool-washing mechanisms. The method employed in the construction of the machine made by this firm will be generally understood by users, and, therefore, the following description will show that it possesses important parts superior to those which they have supplanted. We have paid a visit to Messrs. Radford, Bradley and Co.'s wool washing works at Valley Mills, Bradford, and have seen the machine at work, and, therefore, the testimony which we give is the result of our own observation, and is also backed up by the experience of the firm who kindly showed us the wool washer at work. The improvements include a new rake delivering motion, a water elevator, and a new pronged immerser. The new rake delivery motion consists of an inclined plain, or ridged plate of brass, extending a few inches higher than the water line, from which point the plate takes a turn, and recedes in an incline, until it reaches the nip of the rollers. The ordinary rakes are employed, and these carry the wool along in the usual way until it reaches the delivery rake, which just lands it over the bend of the ridged plate. There the latter is perforated with small holes, which allow the water to drain away from the wool before it is drawn through the rollers, from whence it is carried along the brattice to the next machine, or, in the case of the last of the set of machines, to the beater fan, when the process of washing is completed. The purpose for which the new water elevator is used is as follows:—the water running through the perforations in the ridged plate is conducted into a dish or trough under the squeezing rollers, but the former does not descend in small streams as might be imagined, as this would be by no means a successful way of carrying off the water, but it is received upon a plate placed immediately under the ridged plate, and fixed at the same angle, thereby avoiding the drawing or suction of the wool through the perforations. The water then falls in a continuous spray-like stream immediately under the nip of the rollers. From here it is conducted in a cast iron trough to the elevator. The water elevator has six buckets attached, which deliver the water from the trough back into the washing bowl. The improved pronged immerser is employed for the purpose of opening the wool as the brattice delivers it into the washing machine. This consists of a perforated cylinder, having eight sets of curved forks arranged in straight rows, at regular intervals, around the circumference of the cylinder. The cylinder has a backward motion, and the forks are curved in the reverse way to that in which the cylinder revolves. Thus the points

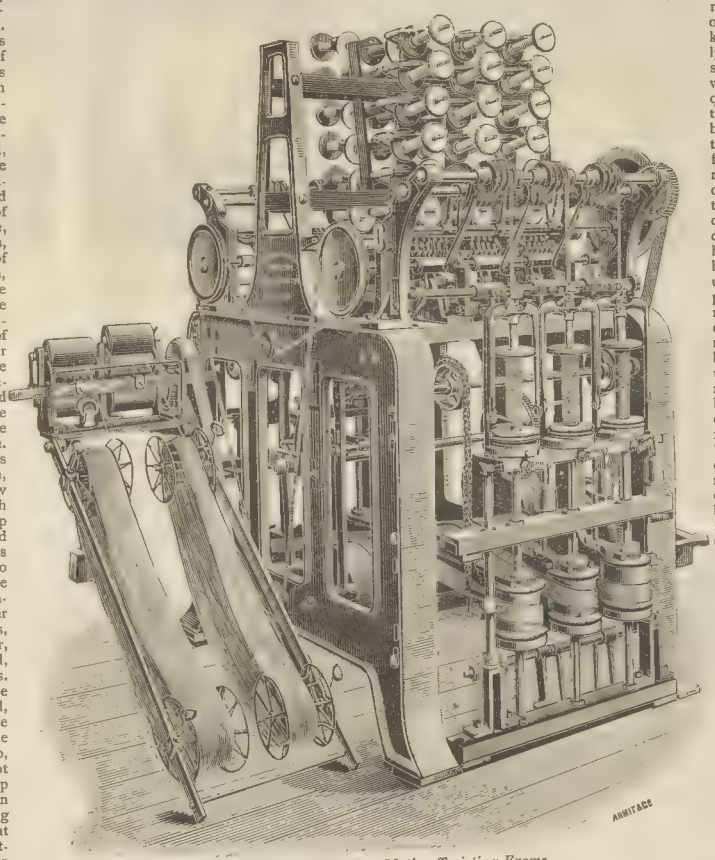


Petrie's Wool Washing Machine.

of the forks do not come in contact with the fibres, and there is, therefore, no dragging or tearing of the wool, which falls between each row of forks, and is at once opened out to its full extent while being carried into the trough. The firm who showed us this machine informed us that they find, by using this improvement, that the wool being thus opened on its entry into the bowl produces, not only a better colour but also, a greater proportion of top to noil in its finished state, and, further than this, they say that the cost of repairs is almost *nil*. This latter is, in itself, a most important point, for the same firm are now saving a considerable amount which would otherwise have to be expended in keeping a machine in perfect working order. As to the machine producing more top, and of a better colour than is usual, this is a point which requires no comment, as it speaks for itself, particularly as the testimony is an independent one, given by a firm who have had experience of it, for which reason we are pleased to draw attention to it. We do not consider that any further words of ours are required to commend the machine to our readers. Messrs. John Petrie, Jun., Limited, will be pleased to give any further information. Their works are in River Street, Rochdale.

Messrs. G. H. Holden and Co's. Stop-Motion Twisting Frame.

We beg to call the attention of manufacturers of twisted yarns of various fibres, comprising jute, hemp, flax, woollen, cotton, and silk, to a machine which has, of late had the special attention of the firm of Messrs. Holden and Co., and been successfully developed by them. Many of the manufacturers of the above classes of fabrics have adopted this system, which is giving them every satisfaction. The principal feature of their machine is the application of a stop-motion to each single thread, which instantly stops the spindle and the corresponding roller when any single end breaks. The advantage of this will be seen at a glance, as it prevents any large knots, as well as the making of waste. In the stronger yarns, such as jute and hemp, the production is above double that of the ordinary twisting frame; the stopping of the spindle and the roller being independent — the frame is continuously running, whereas, under the old arrangement, when any single end breaks, the girl in charge has to stop the whole frame. The spindles of these frames are of the usual construction, but are supplied with a New Patent Claw Clutch, which gives a very positive stop and start, quite noiseless and thoroughly efficient in its action, and can be run up to a very high speed. The spindles are of the best construction, and, in the larger machines, have four bearings, viz:—on the foot, the bolster, the traveller, or lifting rail, also on the top of the flyers. The arrangement of the driving spindles is very good, superior to anything before introduced; each spindle is driven by a 2½in. strap, by an arrangement which, not only gives a very long strap but also, gives equal tension to every spindle, thus avoiding the difficulty of slack or light straps, and, of course, preventing irregular twist. This same principle of stop motion is carried out for all classes of yarn, and has proved most successful. The above named firm are makers also of special machines, on the most approved principle, for the manufacture of cabled yarn, of all sizes, on a system which gives a very large production and first-class work; as well as of winding frames. The machine shown in the accompanying illustration is one of their make; the front bobbin of which is 10in. by 5in. On each spindle is a pulley 5in. in diameter, driven by a 2½in. strap. These machines are usually made 60 spindles long—30 on each side, and 9in. guage. For small manufacturers of doubled yarn, they make a small machine of 6 or 8 spindles, with a hank winder attached, by which the yarn can be wound off the hank upon the bobbin, and then fixed in the creel.



G. H. Holden and Co's. Stop-Motion Twisting Frame.

The charge for telegrams to Germany, France, Holland, and Belgium, is fixed uniformly at 2d. per word, 10*d*. being the minimum charge.

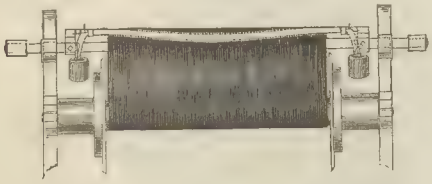
A Rational Method of Firing Steam Boilers.

In those good old times, when England was the sole master of the markets of the world, and when competition had not reached its present gigantic proportions, under which present condition only those manufacturers seem to have a chance in the great struggle for supremacy who are fitted up with the most improved machinery, the mill itself claimed the master's chief attention, and the boiler-house, with its dirt and heat, was rarely visited, but left to the firemen. The coal bill was then of small importance compared with the profit realised, and the manufacturer felt little inclination to meddle with the old-fashioned methods of firing, which were passed down from father to son. Nowadays, however, it has become a very serious question for the manufacturer to produce his steam at the cheapest possible cost, and the difference that can be made in the coal bill by different modes of firing often represents a large percentage of the yearly profit. The old methods are the outcome of a gradual development, influenced by accessory circumstances, and by no means the result of sound, rational, reasoning. Big chimneys were erected, not only to provide the draught necessary for combustion but, to carry away the smoke, although it would have been much wiser and cheaper to burn the latter. When we consider what is required to obtain perfect combustion of coal, in other words, to get as much value out of the coal as possible, and, at the same time, to prevent that abominable smoke nuisance so injurious to the lives of our population, we find that we require, besides the coal, a certain elevated temperature, and a given measured quantity of air per quantity of coal. It is well known that, if the quantity of air supplied exceeds the required limit, there is waste of heat. Everybody also knows that, if coal in a finely divided state is gently sprinkled over a hot fire, it will at once ignite and burn quickly and completely. A thin fire is theoretically the best, but, practically, there is the objection that, with hand firing, the fire-doors would require to be opened too often, causing waste of heat through the inrush of the cold air. It will, also, not be disputed that, the longer the heat can be confined in the boiler, the greater will be the useful effect, but, with our present system of draught by means of big chimneys, it is obvious that, before the air necessary for combustion can be sucked through the fire, useful heat, that ought to remain much longer in the boiler, must be drawn up the chimney before the air can rush in below the grate. This being so, it must strike every enquiring mind that the most rational way of burning coal in steam boilers would be to start with a level hot fire, and then to sprinkle the coal in a finely divided state, and in measured quantities, continuously over the hot fire, without opening the fire-door, supplying the air necessary for combustion, also, in measured quantities, and in such a way that the heat at the other end of the fire need not be drawn up the chimney before it has been fully utilised. In this way, the coal would be burnt completely, there would be no smoke, and the greatest possible value would be obtained out of the coal. This is actually being done in a practical and most successful manner by Hodgkinson's Patent Sprinkling Stoker, combined with forced draught, the two united having produced the most satisfactory results in a number of mills both at home and on the Continent, as well as in America, where the system has been tried for months and years past on a large scale. The advantages of forced draught have, of course, long been realised, and it has been tried over and over again, but, in order to be successful and present no drawbacks, it is absolutely necessary that the quantity of coal should be in correct proportion to the air, that the fires should be thin and continuously supplied, which, of course, is not possible with hand firing and other mechanical stokers. The sprinkling system, on the contrary, lends itself admirably to this combination, as the supply of coal is in continuous measured quantities spread most evenly in thin layers over the whole fire, and the absence of draught from the chimney, in consequence of the supply of the necessary air by a blower, prevents the carrying away of any of the fine coal into the flues. Here then, all the

features of successful combustion are combined in a most simple manner, and in such a way that nothing can possibly get out of order. The coal fed by hoppers, in the usual way, passes into the measuring and crushing cylinder, in which a strong roller with coarse spiral grooves revolves against an equally strong cast steel plate, measuring the coal, and crushing any large pieces that may be amongst the slack used. A spring at the back of the plate prevents breakage in case a stone or other hard substance should be amongst the coal. Falling thence into the distributing cylinder below, it is continuously and evenly sprinkled over the fire by means of a revolving distributor of a peculiar concave form. Owing to this peculiar form, the result of long experience, the distribution is perfectly even all over the fire, and, consequently, the blast of air does not encounter more resistance in one place than in another, rendering the supply of air uniform all over. The fire becomes one incandescent sheet of flame, and the coal burns completely at the same rate at which it is supplied, as the speed of the coal measurer is regulated by means of cone pulleys. There are, therefore, only two working parts in this stoker, the measurer and crusher and distributor, both of which are very strong, and cannot wear out, and if they did, could be replaced at a trifling expense at any time. Hand firing can also be resorted to at any moment, without the least stoppage, as each flue has its own fire-door, as large as is usual for hand firing, which is very important. The chimney being only required to carry off the spent gases, the dampers are almost closed, and thus the heat remains in the boiler until more fully utilised. It would be impossible to exceed the simplicity of this system, while the results obtainable have been confirmed in many instances, and on a large practical scale, both at home and abroad. They are, therefore, conclusive, and not a mere experiment, Common slack can be used with this system, giving the same results of evaporation as large expensive coal; the smoke nuisance is entirely prevented, and a largely increased duty is obtainable from the boiler, as certified to by users at home, on the Continent, and in America. The simplicity is so great that the makers of this system, Messrs. Hodgkinson and Co., Limited, Manchester, have scarcely ever to repair their machines, unless owing to the careless neglect of the firemen.

Huck's Patent Warp Damper.

The agitation which has recently been going on amongst the operatives in Lancashire engaged in the factories where heavily sized warps are used, and where the steaming of sheds is the rule, has brought out various devices for mitigating the evil of steaming. We have given, in former numbers of our Journal, particulars of some of the apparatus used for this purpose, and, as the agitation is likely to bring about a state of things which will, in a great measure, reduce the present system of steaming, it behoves manufacturers engaged in the working of goods having sized warps to see, without delay, which is the appliance best adapted for the damping of them. We, therefore, propose to bring before our readers, from time to time, the latest inventions calculated to effect the desired object in an efficient manner. Perhaps, the latest mechanism for the purpose is one recently patented by Mr. Huck, St. James' Hall, Burnley, and, as this appliance is cheap and guaranteed to work effectively, it should meet with much attention. Mr. Huck's idea is based on the natural laws of capilarity and condensation, and undoubtedly this is a step in the right direction. The apparatus is simple, and can be fixed to a loom in a few minutes. It consists of two cans containing water and a web made of cotton. The cans are hung level with each other at convenient heights just above the warp beam, one at each end. Water is then poured into them at the top through a funnel or slit. The cotton web is made thoroughly wet, and one end is put into the

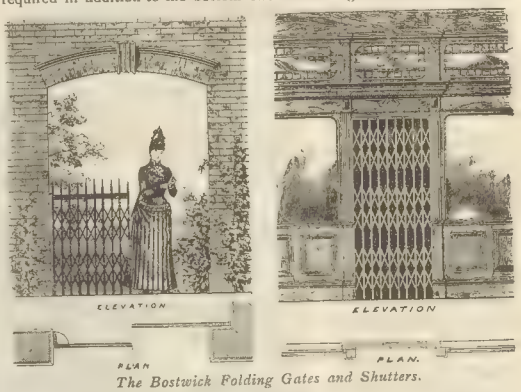


Huck's Patent Warp Damper.

can through the slit in the lid, and the other end is put into the can at the other end of the warp beam. The cotton web thus lies flat upon the warp, clips being used, one over each end of the carrier bar, which keep the web firm without pressing unduly upon the warp threads. As the weaving goes on, and the warp moves forward, it is being steadily damped, the cotton web taking up the liquid from the cans as long as the latter contain any water. The supply of moisture can be regulated to differently sized cloths by simply varying the height of the cans; for extra-heavy sizing, the cans can be placed above the beam and attached to the loom side by pieces of cord. The illustration shows one method of fixing the appliance, but this can be varied according to the pattern, &c., of the loom and the description of warps being woven. It has been already tried practically and has been found to answer the purpose for which it has been invented in an admirable manner. Mr. Huck guarantees that it will benefit masters and men alike, inasmuch as more work of a satisfactory character can be done, in a given time, than with the present system. The apparatus for ordinary looms costs one shilling each, and as it does not require any practical hand to fix it ready for working, it should meet with an extensive sale. It can be seen by calling upon Mr. Huck, or a sample appliance can be had for one shilling.

The Bostwick Folding Gates and Shutters.

An invention which will be of interest to manufacturers is that of the Bostwick Folding Gates and Shutters. There are many situations and positions in which a gate would be of great benefit, but, unfortunately, from want of space, such cannot be fixed. This mechanism overcomes the difficulty entirely, as no room is required in which to swing back the gate, which is of an entirely novel construction. From the illustration here given, some idea as to what the invention consists of may be easily gathered, and the following description will further enable our readers to thoroughly understand the benefits to be derived from its use in certain cases where the old style of gates cannot be used. The principle upon which they work is that of trellis-work, but this is old enough. However, ordinary trellis-work in expanding becomes reduced in height. This is the point at which the ingenious invention comes in, for, whether open or shut, no variation in the height of the gates is caused. They consist of channelled steel bars arranged in pairs, channel to channel, forming vertical bars. Between these channels is placed the lattice work, made after the style of lazy tongs, and, therefore, as the gate is opened the lattice expands. The vertical bars are fitted with small rollers which run upon a rail, so that the action of opening a gate is quite easy, and requires no amount of strength. The invention is equally suitable for doors and shutters, but, in the latter cases, a top rail is required in addition to the bottom one. With gates, however, it is not



The Bostwick Folding Gates and Shutters.

necessary to have the top rail, as, in order to give them the proper degree of firmness, a folding truss of a novel description is applied. In the case of a door, or even a gate, it might be said that an obstruction would be caused at each side when the bars are folded. Such is not the case, as they are so constructed that they fold into about the same number of inches as they are feet wide, when extended and, recesses being formed in the post at each side, they slide into them and are quite hidden from view. There is scarcely an end to the purposes to which this invention can, with profit, be applied in factories, sheds, warehouses, or offices. We have already mentioned its application where an ordinary gate is not possible, and may instance one or two other ideas for its adoption which occur to us. Take, as an example, a weaving shed, where the looms are so often crowded together. The space required for an ordinary door could be well utilised. In dyeworks, where there is a constant hurrying backwards and forwards with pieces, the usual door is often an obstruction. In a factory, these doors should be used for the hoists; whilst, for offices, they can be employed as shutters for the windows. The Folding Gate and Shutter Company, 73, Queen Victoria Street, London, will be glad to give further information to our readers, or this may be obtained from the agents, Messrs. G. W. Allen and Co., Brazennose Street, Manchester.

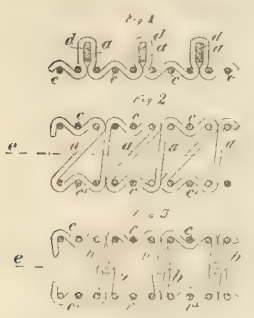
New Patents in Fabrics.

CHENILLE CARPETS, CURTAINS AND OTHER FABRICS.

A patent has been taken out for improvements in the production of double-sided and single-sided chenille or velvet cloth, carpets, curtains, and other fabrics, by the methods here described. To produce a double-sided chenille or velvet cloth, carpet, curtain or other fabric in an ordinary loom, worked by hand or power, each side or face of the fabric, having the same pattern, a set of chenille warps is prepared to form the pattern. The chenille fur or warp may be prepared either by the ordinary methods or by an improved method as follows:—Instead of forming the chenille with various coloured threads worked off different shuttles, it is woven in a plain cloth on a hand or power loom, and the various colours are printed on the cloth thus prepared, for which purpose, a circular drum is preferred, as in tapestry printing. The improved double-sided fabric is clothed by using one dead warp, along with a binding warp, wrought in two healds, while the weft which is concealed in the fabric is thrown across the warp in the usual manner, giving a double binding shot to the fabric. When it is desired that the two sides or faces of the fabric should have different patterns, sets of two chenille warps are prepared, one set having the required pattern for one side, and the other set forming the pattern for the other side. To produce, on an ordinary loom, a

single-sided fabric, *i.e.* a fabric having a chenille face on one side only, a set of chenille warps is prepared to form the required pattern, and the fabric is clothed by using a dead warp under the chenille warps on the pattern side of the fabric, while plain warp threads and underbinding weft shuttle are used to form the plain side of the fabric. The chenille warps can be worked off bobbins in the same way as worsted in a Brussels loom. In producing the chenille for the warps—silk, wool, worsted, jute, cotton, or any other suitable fibre, are used, either singly or mixed, and in such a degree of fineness or thickness as is best suitable for the particular fabric, in the preparation of which the warps are intended to be used. In producing improved double-sided fabrics on a jacquard loom, two or more plain chenille wefts are used, the pattern being formed by warps concealed in the fabric as in an ordinary Scotch or Kidderminster loom. The chenille is worked from two or more shuttles, different chenilles being on different shuttles. The jacquard acts on the warps, causing them to rise or fall according to the requirements of the design. The required shuttle carries its chenille between the warps in the position in which the jacquard places them. In case of two plain chenilles of different colours, each would be used alternately, and would appear above or below the concealed warps, according as these were acted on by the jacquard. The ley used is a heavy one, and drives the two chenille wefts compactly together, so that parts of the one chenille appear on one face of the cloth, and parts on the other face, while parts of the other chenille appear in the intervals. In this way, the same pattern appears on both faces of the fabric, but the chenille which forms the figures on one face of the fabric forms the ground on the other face. The chenille may be of one colour, or it may be of various colours to produce different effects, and it may be made of silk, worsted, jute, cotton, or of any other suitable fibre, singly or mixed. The warps and binding wefts are all concealed in the fabric. A velvet surface is thus produced, having the same pattern on both sides, but with the colours reversed, Thus, with one dark and one light chenille weft, that part of the pattern which is dark on one side of the cloth will be light on the other.

VELVET AND PLUSH GOODS.



This invention relates to the manufacture of double woven velvet and plush goods. In weaving double fabrics of the indicated description, the pile threads are woven into both warps, and extended between the two warps, so that the fabrics are connected by the said pile threads. Goods so woven do not possess, when cut, the same finish and appearance apparent in goods which have been woven singly with binding wires or blades, or the like, in the pile warp. The patentees have, therefore, devised a novel method of weaving such goods, so that the cutting of the pile is performed under more favourable conditions and with an improved result. The accompanying drawings illustrate a single pile fabric as ordinarily woven with wires or cutting blades in the pile warp, and as shown in cross section at Fig. 1. Fig. 2 is a cross section of a double pile fabric woven in the usual manner. Fig. 3 is a cross section of a double fabric woven according to the improved method. In Fig. 1, the pile warp *a* is woven into the warp *c* and over the cutting blades *d* in the usual manner. In Fig. 2, the pile warp *a* is woven into the two warps *c*. c^1, and connects the double fabric, which is afterwards dissevered by cutting the warp *a* at or about the dotted line *e*. The different angles of the pile warps *a*, extending between the two warps, cause the cutting to be performed under unfavourable conditions, and cause unequal lengths of pile, whereby the appearance of the finished article is wanting in smoothness and finish. In the improved method of weaving, illustrated at Fig. 3, the pile warps *b* are woven into the warps *c*. c^1 but, instead of crossing from the upper to the lower warp, as in Fig. 2, the warps are looped into each other, or knitted together, between the warps, as indicated in Fig. 3. A double fabric woven in this manner presents the pile warp in an almost perpendicular position to the action of the reciprocating cutting knife, which is operated in the plane indicated by the dotted line *e* Fig. 3. This looping is produced by means of a special looper device. For this looping, there are required two shafts for ground warp, two carrier shafts and two looper shafts, the healds of which pass through the eyelets of those of the carrier shafts. The carrier shafts and the looper shafts are suspended by a cord passing round a roller in such a manner that, when the carrier shaft is pulled, the looper healds are drawn through the eyelets of the carrier shaft, until the ends reach the eyelets of the carrier shaft. Each pile thread is not only passed through an eye of one of the healds of the shaft for the ground warp, but also through an eye of the looper shaft, in such a way that, when the shafts of the ground warp rise, the looper healds are drawn out of the eyelets of the carrier shafts. To enable the pile threads to draw out the looper healds from the eyelets of the carrier shaft more easily, the carrier shaft must be slackened for picks. The pile threads, for three picks, are woven in the ground tissues and are then suddenly looped to form the pile, the next three picks are woven in the ground tissues, and so on. The looping device is, therefore, so applied that the front carrier shafts with the looper healds effect the looping and binding of the pile threads in the ground tissues for the succeeding three picks, while the ground warp shafts effect the back looping of the pile threads and the binding into the ground tissues for the next three picks. By the looping of the pile threads over each other, the following results are obtained. The required connection between the two tissues to form the pile is obtained. Each pile thread *b* can be woven separately into the upper and lower tissues. The pile threads acquire a nearly vertical position. The double tissues which are thus produced are cut in the usual manner.

IMPROVEMENTS IN PRINTING ON FABRICS.

A patent has been granted to Mr. James Kerr, of the firm of S. Steiner and Co., the well-known calico printers of Church, near Accrington. This invention has for its object the providing simple and efficient apparatus whereby two sides of the fabric can be printed simultaneously, without the use of a central cylinder or bowl and blanket, which are used in such printing machines in ordinary use; and, when so desired, the impressions on one side can be made to coincide exactly with impressions on the other side of the fabric. To accomplish this, one or more pairs of printing rollers are provided, the individual rollers of each pair being placed opposite to each other. The fabric to be printed on is then passed between the pair, or pairs of rollers, so as to be in contact with each roller of the pair, or with all the rollers of the pairs, at the same time. The rollers may print the same pattern on each side, or different patterns may be printed on the two sides. In patterns printed with one colour, one pair of rollers can be used, but in printing with more than one colour, the number of pairs of rollers will correspond with the number of colours, and the pairs will print on the fabric, one after the other, as the fabric passes between the several pairs. Results are obtained, by simple and efficient means, equal, or superior, to those which have hitherto only been obtained by the use of complicated mechanism, and this beneficial effect is especially the case when printing with more than one colour. It will be evident that a machine arranged according to this invention is capable of printing either on both sides of one fabric, or on one side of each of two fabrics placed back to back, each roller, or series of rollers, to print either the same or a different pattern on the two sides.

Electric Light.

It seems that, before long, illumination by gas in factories will be rare, so far as concerns the best firms. We are continually inserting paragraphs in our Journal upon new installations of the electric light, which prove that, for mill purposes, it is steadily superseding gas. That this is so is further shown by the installations which Mr. Wilson Hartnell of Leeds has in hand at present, these include a carpet manufactory in the North, a large flour mill at Leicester, and a wholesale clothing factory in Leeds, in the latter of which there will be seven hundred lights. In addition to factory work, Mr. Hartnell is fitting the electric light in a large mansion in Westmoreland, to be driven by a petroleum engine; he has in hand, also, mansions near Belfast to be driven by gas engines. One of the most important installations is that at the Town Hall at Dewsbury, to which we will refer further when finished. Many well known firms have had their mills lighted by the installations of Mr. Wilson Hartnell, amongst which are Messrs. J. Brook and Sons, Armitage Bridge, Huddersfield; L. Dodgshun and Co., Leeds; Garnett and Sons, Apperley Bridge, Bradford; Harrington Factory Co., Nottingham; Martin, Sons and Co., Lindley, Huddersfield; Peel Bros., Thornton; J. Raynor and Co., Huddersfield; B. Vickerman and Sons, Huddersfield; J. L. Walker, Huddersfield; Dixon and Farrar, Bradford; James Drummond and Sons, Bradford; J. and T. Greeves, Forth River Flax Mills, Belfast; also the mills of W. and J. Whitehead, Laisterdyke; and Messrs. Charles Crabtree, Todmorden; J. P. Fearfield, Nottingham; J. H. Hitchcock, Leicester; G, J. McKay, Kendal; E. Sutcliffe, Mirfield; Whitely, Nottingham. Although this is a somewhat numerous collection of textile mills, yet to these we might add over 50 others in various trades, from the proprietors of many of which Mr. Hartnell has received testimonials expressing entire satisfaction with the installations, after they have been in use some time.

The adopted daughter of the late Irish Chief Secretary, Mr. Forster, has nearly succeeded in reviving the manufacture of Limerick lace, an important Irish industry, which has long been neglected. Some years ago, a thousand females were engaged at the local factories. For want of a ready market for the lace, the factories stopped work. Miss Forster, since her marriage with Mr. Robert Vere O'Brien, has lived near Limerick, and she has recently turned her attention to reviving the lace industry, which now bids fair to resume its wonted activity. Assisted by a Committee, she has opened a training school for girls, the pupils of which are making rapid progress in the art. All the necessary material has been supplied to the girls, who, in addition to their ordinary training, receive lessons at the local school of art in connection with South Kensington.

PATENTS.

Applications for Letters Patent.

Belts and coverings for dandy rollers. A. M. Clarke, London.	23rd Apl.	6,813
Breaking or treating flax, &c. A. Spiegelberg, Glasgow.	27th Apl.	7,031
Boiling, dyeing, fastening, and finishing colours on textiles. J. Howarth and W. T. Howard, London.	29th Apl.	7,100
Breaking, stripping, decorticating China grass, &c. A. J. Boult, London.	1st May	7,238
Brakes for looms, &c. W. Hartley, Manchester.	3rd May	7,399
Bordered carpets, &c., and looms. H. Fawcett, London.	17th May	8,261
Combing machines (Noble's rotary). B. Berry and D. B. Briggs, Bradford.	26th Apl.	6,969
Comb cylinders of Heilmann machines. T. W. Harding, Leeds.	27th Apl.	7,045
Cutting or severing cloth down centre, &c. J. Howarth and W. T. Howard, London.	29th Apl.	7,103
Cutting float threads in tulles, &c. W. E. Heys, Manchester.	2nd May	7,290
Carpet-holder (Harrison's). T. Harrison, Carnforth.	4th May	7,488
Carpets (Wilton and Moquette). R. B. Loynd, London.	6th May	7,546
Calico printing. J. Sutherland, London.	8th May	7,680
Coloured cotton weft pile fabrics. B. Ellinger, Manchester.	11th May	7,877
Cylinders, taker-in rollers, doffers, breasts, &c., of carding engines. R. Tatham, Manchester.	11th May	7,888
Cleansing and bleaching fibrous materials and fixing organic colouring matters thereon by acids and alkaline residues of naptha manufacture, &c. V. Schevelin and P. Mindovsky, London.	14th May	8,107
Cup for ring-spinning and bobbins. S. Wilkinson, J. Clarkson and F. Heap, Burnley.	17th May	8,205
Drying and carbonising combined with an elevator and purifying and cleasing apparatus. Société, Simonis, and Chapuis, London.	23rd Apl.	6,793
Dyeing wool on bobbins and textile fabrics in like form. V. D'aoust, London.	24th Apl.	6,876
Dressing yarn for weaving (apparatus).	25th Apl.	6,890
Driving friction motion and weaver's beam in sizing machines. P. Brimelow, Halifax.	25th Apl.	6,905
Dressing or beaming warps. W. C. Hargreaves, London.	22nd Apl.	8,481
Fans or air propellers. A. Scott, Barnsley.	8th May	7,701
Fastening leather on rollers for spinning, &c. H. Haworth and J. P. Binns, Halifax.	13th May	7,928
Fabric (improved). A. J. Boult, London.	13th May	7,967
Fabric (improved). J. J. Ashworth, London.	17th May	8,260
Figured cloth. J. B. Hodgkinson, London.	23rd May	8,571
Grinding the edges of webs of cloth to cloth finishing machines. J. J. Scholfield, London.	6th May	7,559
Guiding woven fabrics to stretching, &c., machines. W. Birch, Manchester.	24th May	8,628
Holding spools or bobbins in machines for winding thread thereon. H. H. Lake, London.	24th May	8,681
Indicating and recording in the feed or bulk of fibre supplied to cotton scutchers and openers. J. H. Whiteley, Halifax.	21st May	8,431
Jacquard card punching machines. P. Pearson and A. Godward, London.	13th May	7,953
Jacquard Brussels and velvet carpets. F. B. Fawcett, Kidderminster.	21st May	8,406
Jacquards. T. and A. P. Townend and J. Eaton, London.	23rd May	8,613
Knitted pile fabrics. R. H. Lendrum and D. Dytch, London.	17th May	8,262
Looms for pile fabrics. G. W. Grosvenor, London.	24th Apl.	6,868
Lace and other reticulated and woven fabrics. F. H. Bowman, Bradford.	2nd May	7,297
Lifting any single heald in looms. H. Crosland, Halifax.	10th May	7,821
Looms. J. Culpan and H. Cockroft, Manchester.	14th May	8,006
Moistening and damping heavy sized goods during weaving. D. H. Wilkinson, London.	4th May	7,447
Making-up woven fabrics in pieces. T. F. Myers, Bradford.	15th May	8,074
Mordanting by drying cotton yarns, &c. T. Parkinson, London.	17th May	8,237
Obtaining, treating, bleaching fibres, fibrous materials, textile fabrics and matters of vegetable origin and the recovery of waste products therefrom. H. Ledger, Leek.	24th Apl.	6,827
Obviating the ejection of loom shuttles. E. W. A. Bar, London.	26th Apl.	6,978
Opening and cleaning cotton, &c. B. A. Dobson, W. Hamer and W. Butterworth, London.	15th May	8,079
Pattern lags and pegs. E. O. Taylor and G. Marsden, London.	2nd May	7,333
Purifying water for boilers, &c. G. W. Allen and H. J. A. Bowers, Manchester.	17th May	8,217
Printing designs in several colours at one operation on cloth, &c. D. and R. Walker, Manchester.	21st May	8,477
Picking shaft "Top or cap" in looms. J. T. Lishman, Bradford.	22nd May	8,487
Pegs (securing) for forming pattern surfaces. W. C. Hamilton and A. Barraclough, Bradford.	22nd May	8,488
Picking motion. J. T. Ball and R. Whitaker, Bolton.	23rd May	8,578
Picker. S. and J. W. Clegg, Ashton-under-Lyne.	23rd May	8,589
Picking mechanism. C. S. Brooke and E. Beaumont, Huddersfield.	24th May	8,688
Reels, spools, &c. F. J. Jones, Leek.	24th Apl.	6,881
Regulating the position of retaining rollers in spinning frames. G. Hunter, Belfast.	27th Apl.	7,021
Reed arrangement for warping mills or beaming frames. J. Butterworth, London.	9th Apl.	7,765
Reeds (loom). R. Schabensky, London.	13th Apl.	7,960
Regulating mechanism for tulle or bobbin net frames. A. D. Thirion, London.	17th Apl.	8,253
Shuttle-guard (automatic). E. Edwards, London.	25th Apl.	6,940
Stitching and trimming machine. W. Campion, London.	24th Apl.	6,947
Spinning T. Jenny, London.	1st May	7,282
Self-acting shuttle guard. J. Pickup, Manchester.	2nd May	7,299
Shuttle box looms (circular). R. Foulds, London.	2nd May	7,312
Shuttle guards. C. Haase, Mittweida.	4th May	7,469
Spinning (ring) and doubling. S. H. Brooks and F. Barlow, Manchester.	2nd May	7,334
Shuttle guards. A. Steinhouser, London.	4th May	7,455
Shuttle boxes of looms. J. W. Howard, Halifax.	8th May	7,693
Shuttle guard. R. Schofield and W. Haslam, Manchester.	9th May	7,751
Stamped velvet, &c. C. Hollender, London.	13th May	7,957
Shuttle guard. R. Charnley, London.	13th May	7,961
Spraying oil, water, &c., in washing, carding or combing, also damping woollen stuffs. E. Cruise and B. Berry, Bradford.	18th May	8,286
Spinning, doubling, roving wool, &c. P. Wallace, Halifax.	21st May	8,410
Stretching woven material. J. Wadsworth and J. Haddow, Manchester.	21st May	8,413
Treating hemp, &c. (combination and mode of). B. W. Weatherdon, London.	27th Apl.	7,058
Top clearers for spinning and preparing machines and apparatus. J. and W. Catterall, London.	20th Apl.	8,347
Tension weights for shuttles. J. C. Fell, London.	24th Apl.	8,693
Vegetable fibres (treatment of). V. Schevelin and P. Mindoosky, London.	15th May	8106
Weavers' shuttles and shuttle tongues, E. Haworth, Burnley.	23rd Apl.	6,779
Woollen condensing machinery. A. Marsden, A. Laycock and A. Stephenson, Huddersfield,	1st May	7,269
Winding yarns or threads into cops. F. Rosskothen, Manchester.	4th May	7,439
Weaving slit-ups. E. M. Whipp, T. Roberts, J. Hargreaves and J. Townsend, Halifax.	24th May	8,635
Winding yarn or thread on spools or bobbins. H. H. Lake, London.	24th May	8,680 8,682 and 8,683
Yarn-dressing frames. J. Garstang, London.	11th May	7,865

Patents Sealed.

17,487	2,080	3,267	5,602	5,645	5,852	5,896	6,232
11,020	14,799	15,654	18,717	786	2,573	3,045	3,105
3,106	3,405	3,676	4,548	4,907	5,394	5,597	5,659
5,795	5,616	5,883	5,941	5,966	5,999	6,074	6,114
13,971	18,517	18,847	229	592	989	1,128	15,283
3,558	3,586	6,069	6,262	6,263	6,301	6,312	6,492
6,604	7,024	7,414	9,070	16,115	18,431	679	1,825
1,826	1,156	1,705	4,732	5,966	6,029	6,581	6,656
6,676	6,887	6,912	6,973	7,055	7,057	7,239	343
455	1,094	1,173	1,979	1,991	2,002	2,042	2,060
2,142	3,638	5,505	6,811	7,058	7,155	7,326	8,371
2,440	2,441	2,459	2,637	2,685			

Printed for the Publishers by JOHN DALE & Co., 17, *Bridge Street, Bradford, and Published by* HORATIO LORD *and* RICHARD THOMAS LORD, *at* 10, *Ann Place, Little Horton Lane, Bradford.*